Draft Environmental Impact Statement

For The Generic Essential Fish Habitat Amendment to:

SPINY LOBSTER FISHERY MANAGEMENT PLAN QUEEN CONCH FISHERY MANAGEMENT PLAN REEF FISH FISHERY MANAGEMENT PLAN CORAL FISHERY MANAGEMENT PLAN FOR THE U.S. CARIBBEAN

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TABLES

Table 2.1. List of species or species groups in the Spiny Lobster FMP.

Panuliridae

Caribbean spiny lobster, *Panulirus argus* Spotted spiny lobster, *Panulirus guttatus* Smoothtail spiny lobster, *Panulirus laevicauda*

Table 2.2. List of species or species groups in the Queen Conch FMP.

Phylum Mollusca, Class Gastropoda (Snails), Order Mesogastropoda, Family Strombidae Strombus gigas

- S. costatus
- S. pugilis
- S. gallus
- S. raninus

Family Fasciolariidae

Fasciolaria tulipa

Family Cymatiidae

Charonia variegata

Family Cassidae

Cassis flammea

C. madagascarensis

C. tuberosa

Family Trochidae

Cittarium pica

Astrea tuber

Family Turbinellidae

Vasum muricatum

Morays - Muraenidae

- 1. Chain moray, Echidna catenata
- 2. Green moray, Gymnothorax funebris
- 3. Goldentail moray, Gymnothorax miliaris

Snake eels - Ophichthidae

4. Goldspotted eel, *Myrichthys oculatus*

Lizardfished - Synodontidae

5. Sand diver, Synodus intermedius

Frogfishes - Antennariidae

6. Frogfish, Antennarius spp.

Batfishes - Ogcocephalhalidae spp.

7. Batfish, *Ogcocephalus spp*.

Squirrelfishes - Holocentridae

- 8. Squirrelfish, *Holocentrus ascensionis*
- 9. Longspine squirrelfish, *Holocentrus rufus*
- 10. Blackbar soldierfish, Myripristis jacobus
- 11. Cardinal soldierfish, *Plectrypops retrospinis*

Trumpetfishes - Aulostomidae

12. Trumpetfish, *Aulostomus maculatus*

Pipefishes - Syngnathidae

- 13. Seahorses, *Hippocampus spp*.
- 14. Pipefishes, Syngnathus spp.

Flying gurnards - Dactylopteridae

15. Flying gurnard, *Dactylopterus volitans*

Scorpionfishes - Scorpaenidae

Sea basses - Serranidae

- 16. Rock hind, Epinephelus adscensionis
- 17. Graysby, *Epinephelus cruentatus*
- 18. Yellowedge grouper, Epinephelus flavolimbatus
- 19. Coney, Epinephelus fulvus
- 20. Red hind, *Epinephelus guttatus*
- 21. Goliath grouper, *Epinephelus itajara*
- 22. Red grouper, Epinephelus morio

- 23. Misty grouper, *Epinephelus mystacinus*
- 24. Nassau grouper, *Epinephelus striatus*
- 25. Butter hamlet, *Hypoplectus unicolor*
- 26. Swissguard basslet, *Liopropoma rubre*
- 27. Yellowfin grouper, *Mycteroperca venenosa*
- 28. Tiger grouper, Mycteroperca tigris
- 29. Creole-fish, Paranthias furcifer
- 30. Greater soapfish, *Rypticus saponaceus*
- 31. Orangeback bass, *Serranus annularis*
- 32. Lantern bass, Serranus baldwini
- 33. Tobaccofish, Serranus tabacarius
- 34. Harlequin bass, Serranus tigrinus
- 35. Chalk bass, Serranus tortugarum

Basslets - Grammatidae

36. Royal gramma, *Gramma loreto*

Bigeyes - Priacanthidae

- 37. Bigeye, *Priacanthus arenatus*
- 38. Glasseye snapper, *Priacanthus cruentatus*

Cardinalfishes - Apogonidae

- 39. Flamefish, *Apogon maculatus*
- 40. Conchfish, *Astrapogon stellatus*

Tilefishes - Malacanthidae

- 41. Blackline tilefish, Caulolatilus cyanops
- 42. Sand tilefish, *Malacanthus plumieri*

Jacks - Carangidae

- 43. Yellow jack, Caranx bartholomaei
- 44. Blue runner, *Caranx crysos*
- 45. Horse-eye jack, *Caranx latus*
- 46. Black jack, Caranx lugubris
- 47. Bar jack, *Caranx ruber*
- 48. Greater amberjack, Seriola dumerili
- 49. Almaco jack, Seriola rivoliana

Snappers - Lutjanidae

50. Black snapper, Apsilus dentatus

- 51. Queen snapper, *Etelis oculatus*
- 52. Mutton snapper, *Lutjanus analis*
- 53. Schoolmaster, *Lutjanus apodus*
- 54. Blackfin snapper, *Lutjanus buccanella*
- 55. Gray snapper, *Lutjanus griseus*
- 56. Dog snapper, Lutjanus jocu
- 57. Mahogany snapper, Lutjanus mahogoni
- 58. Lane snapper, *Lutjanus synagris*
- 59. Silk snapper, *Lutjanus vivanus*
- 60. Yellowtail snapper, Ocyurus chrysurus
- 61. Wenchman, Pristipomoides aquilonaris
- 62. Vermilion snapper, *Rhomboplites aurorubens*

Grunts - Haemulidae

- 63. Porkfish, *Anisotremus virginicus*
- 64. Margate, *Haemulon album*
- 65. Tomtate. *Haemulon aurolineatum*

Grunts - Haemulidae (cont.)

- 66. French grunt, *Haemulon flavolineatum*
- 67. White grunt, *Haemulon plumieri*
- 68. Bluestriped grunt, *Haemulon sciurus*

Porgies - Sparidae

- 69. Sea bream, *Archosargus rhomboidalis*
- 70. Jolthead porgy, Calamus bajonado
- 71. Sheepshead porgy, *Calamus penna*
- 72. Pluma, Calamus pennatula

Drums - Sciaenidae

- 73. High-hat, *Equetus acuminatus*
- 74. Jacknife-fish, *Equetus lanceolatus*
- 75. Spotted drum, *Equetus punctatus*

Goatfishes - Mullidae

- 76. Yellow goatfish, *Mulloidichthys martinicus*
- 77. Spotted goatfish, *Pseudupeneus maculatus*

Spadefishes - Ephippidae

78. Atlantic spadefish, Chaetodipterus faber

Butterflyfishes - Chaetodontidae

- 79. Longsnout butterflyfish, *Chaetodon aculeatus*
- 80. Foureye butterflyfish, *Chaetodon capistratus*
- 81. Spotfin butterflyfish, *Chaetodon ocellatus*
- 82. Banded butterflyfish, *Chaetodon striatus*

Angelfishes - Pomacanthidae

- 83. Cherubfish, *Centropyge argi*
- 84. Queen angelfish, *Holacanthus ciliaris*
- 85. Rock beauty, *Holacanthus tricolor*
- 86. Gray angelfish, *Pomacanthus arcuatus*
- 87. French angelfish, *Pomacanthus paru*

Damselfishes - Pomacentridae

- 88. Sergeant major, Abudefduf saxatilis
- 89. Blue chromis, *Chromis cyaneus*
- 90. Sunshinefish, *Chromos insolatus*
- 91. Yellowtail damselfish, Microspathodon chrysurus
- 92. Dusky damselfish, *Pomacentrus fuscus*
- 93. Beaugregory, *Pomacentrus leucostictus*
- 94. Bicolor damselfish, *Pomacentrus partitus*
- 95. Threespot damselfish, *Pomacentrus planifrons*

Hawkfishes - Cirrhitidae

96. Redspotted hawkfish, Amblycirrhitus pinos

Wrasses - Labridae

- 97. Spanish hogfish, *Bodianus rufus*
- 98. Creole wrasse, *Clepticus parrai*
- 99. Yellowcheek wrasse, Halichoeres cyanocephalus
- 100. Yellowhead wrasse, Halichoeres garnoti
- 101. Clown wrasse, Halichoeres maculipinna
- 102. Puddingwife, *Halichoeres radiatus*
- 103. Pearly razorfish, *Hemipteronotus novacula*
- 104. Green razorfish, Hemipteronotus splendens
- 105. Hogfish, Lachnolaimus maximus
- 106. Bluehead wrasse, *Thalassoma bifasciatum*

Parrotfishes – Scaridae

- 107. Midnight parrotfish, Scarus coelestinus
- 108. Blue parrotfish, Scarus coeruleus
- 109. Striped parrotfish, *Scarus croicensis*
- 110. Rainbow parrotfish, Scarus guacamaia
- 111. Princess parrotfish, Scarus taeniopterus
 - 112. Queen parrotfish, Scarus vetula

Parrotfishes - Scaridae (cont.)

- 113. Redband parrotfish, Sparisoma aurofrenatum
- 114. Redtail parrotfish, Sparisoma chrysopterum
- 115. Redfin parrotfish, *Sparisoma rubripinne*
- 116. Stoplight parrotfish, Sparisoma viride

Jawfishes - Opistognathidae

- 117. Yellowhead jawfish, Opistognathus aurifrons
- 118. Dusky jawfish, Opistognathus whitehursti

Combtooth blennies - Blenniidae

119. Redlip blenny, *Ophioblennius atlanticus*

Gobies - Gobiidae

- 120. Neon goby, Gobiosoma oceanops
- 121. Rusty goby, *Priolepis hipoliti*

Surgeonfishes - Acanthuridae

- 122. Ocean surgeonfish, Acanthurus bahianus
- 123. Doctorfish, Acanthurus chirurgus
- 124. Blue tang, Acanthurus coeruleus

Lefteye flounders - Bothidae

125. Peacock flounder, *Bothus lunatus*

Soles - Soleidae

126. Caribbean tonguefish, *Symphurus arawak*

Leatherjackets - Balistidae

- 127. Scrawled filefish, *Aluterus scriptus*
- 128. Queen triggerfish, Balistes vetula
- 129. Whitespotted filefish, Cantherhines macrocerus
- 130. Ocean triggerfish, Canthidermis sufflamen
- 131. Black durgon, Melichthys niger
- 132. Sargassum triggerfish, *Xanthichthys ringens*

Table 2.3. List of species or species groups in the Reef Fish FMP (Continued)

Boxfishes - Ostraciidae

- 133. Spotted trunkfish, Lactophrys bicaudalis
- 134. Honeycomb cowfish, Lactophrys polygonia
- 135. Scrawled cowfish, Lactophrys quadricornis
- 136. Trunkfish, Lactophrys trigonus
- 137. Smooth trunkfish, Lactophrys triqueter

Puffers - Tetraodontidae

- 138. Sharpnose puffer, Canthigaster rostrata
- 139. Porcupinefish, Diodon hystix

Table 2.4. List of species or species groups in the Coral FMP.

PHYLUM PORIFERA

Class Demospongiae

Niphates digitalis

N. erecta

Aphimedon compressa

Spinosella policifera

S. vaginalis

Geodia neptuni

Chondrilla nocula

Cynachirella alloclada

Tethya crypta

Myriastra sp.

Haliclona

PHYLUM CNIDARIA

Class Hydrozoa

Order Hydroida

Order Milleporina

Millepora spp.

Order Stylasterina

Stylaster roseus

Class Anthozoa

Order Antipatharia

Antipathes spp.

Stichopathes spp.

Subclass Octocorallia

Order Alcyonacea

Family Anthothelidae

Erythropodium caribaeorum

Iciligorgia schrammi

Family Briareidae

Briareum asbestinum

Family Telestacea

Table 2.4. List of species or species groups in the Coral FMP (Continued)

Telesto riisei

Order Gorgonacea

Family Gorgoniidae

Gorgonia mariae

G. ventalina

G. flabellum

Pseudopterogorgia acerosa

P. americana

P. bipinnata

P. rigida

P. albatrossae

Pterogorgia anceps

P. citrina

Family Plexauridae

Eunicea mammosa

E. succinea

E. laxispica

E. fusca

E. laciniata

E. touneforti

E. clavigera

E. knighti

E. calyculata

Muricea atlantica

M. muricata

M. pinnata

M. laxa

M. elongata

Muriceopsis sp.

M. sulphurea

M. flavida

Plexaura flexuosa

P. homomalla

Pseudoplexaura porosa

Table 2.4. List of species or species groups in the Coral FMP (Continued)

- P. flagellosa
- P. wagenaari
- P. crucis

Plexaurella dichotoma

- P. nutans
- P. grandiflora
- P. grisea
- P. fusifera

Family Ellisellidae

Ellisella spp.

Order Scleractinia

Family Astrocoeniidae

Stephanocoenia michelinii

Family Pocilloporidae

Madracis decactis

M. mirabilis

Family Acroporidae

Acropora palmata

A. cervicornis

A. prolifera

Family Agaricidae

Agaricia agaricites

- A. fragilis
- A. tenuifolia
- A. lamarcki

Leptoseris cucullata

Family Siderastreidae

Siderastrea siderea

S. radians

Family Poritidae

Porites astreoides

- P. porites
- P. branneri
- P. divaricata

Table 2.4. List of species or species groups in the Coral FMP (Continued)

Family Faviidae

Favia fragum

Diploria clivosa

D. strigosa

D. labyrinthiformis

Manicina areolata

M. mayori

Colpophyllia natans

Cladocora arbuscula

Montastrea annularis

M. cavernosa

Solenastrea bournoni

Family Rhizangiidae

Phyllangia americana

Astrangia solitaria

Family Meandrinidae

Meandrina meandrites

Dichocoenia stokesi

D. stellaris

Dendrogyra cylindrus

Family Mussidae

Mussa angulosa

Scolymia lacera

S. cubensis

Isophyllia sinuosa

Isophyllastrea rigida

Mycetophyllia lamarckiana

M. aliciae

M. danae

M. ferox

Family Caryophyllidae

Eusmilia fastigiata

Tubastrea aurea

Family Oculinidae

Table 2.4. List of species or species groups in the Coral FMP (Continued)

Oculina diffusa

Order Actiniaria

Condylactis gigantea

Bartholomea annulata

Hereractis lucida

Aiptasia tagetes

Lebrunia spp.

Stichodactyla helianthus

Order Zoanthidea

Zoanthus spp.

Order Corallimorpharian

Ricordia florida

Discosoma spp.

(formally Rhodactis)

Phylum Mollusca

Class Gastropoda

Order Mesogastropoda

Family Strombidae

Strombus spp. (except

Queen Conch (S. gigas)

Family Ovulidae

Cyphoma gibbosum

Family Ranellidae

Charonia tritonis

Order Neogastropoda

Family Olividae

Oliva reticularis

Order Sacoglossa

Family Elysiidae

Tridachia crispata

Class Bivalvia

Orden Limoida

Family Limidae

Table 2.4. List of species or species groups in the Coral FMP (Continued)

Lima spp.

L. scabra

Order Ostreoida

Family Spondylidae

Spondylus americanus

Class Cephalopoda

Order Octopoda

Family Octopodidae

Octopus spp. (except

the Common Octopus

(O. vulgaris)

Phylum Annelida

Class Polychaeta

Family Sabellidae

Sabellastarte magnifica

Sabellastarte spp.

Family Serpulidae

Spirobranchus giganteus

Phylum Arthropoda

Sub-phylum Crustacea

Order Decapoda

Family Stenopodidae

Stenopus hispidus

S. scutellatus

Family Hippolytidae

Lysmata spp.

Thor amboinensis

Family Palaemonidae

Periclimenes spp.

Family Alpheidae

Alpheaus armatus

Table 2.4. List of species or species groups in the Coral FMP (Continued)

Family Diogenidae

Paguristes spp.

P. cadenati

Family Majidae

Mithrax spp.

M. sculptus

M. cinctimanus

Stenorhynchus seticormis

Family Grapsidae

Percnon gibbesi

Family Squillidae

Lysiosquilla spp.

Gonodactylus spp.

Phylum Bryozoa (Ectoprocta)

Phylum Echinodermata

Class Stelleroidea

Oreaster reticulatus

Linckia guildingii

Ophidiaster guildingii

Astropecten spp.

Ophiocoma spp.

Ophioderma spp.

Ophioderma rubicundum

Astrophyton muricatum

Davidaster spp.

Nemaster spp.

Analcidometra armata

Class Echinoidea

Diadema antillarum

Echinometra spp.

Lytechinus spp.

Eucidaris tribuloides

Table 2.4. List of species or species groups in the Coral FMP (Continued)

Tripneustes ventricosus

Class Holothuroidea

Holothuria spp.

Phylum Chordata

Subphylum Urochordata

Phylum Chlorophyta

Halimeda spp.

Penicillus spp.

Caulerpa spp.

Ventricaria ventricosa

Udotea spp.

Phylum Rhodophyta

Phylum Angiospermae

Thalassia testudium

Syringodium filiforme

Halophilia spp.

Halodule wrightii

Ruppia maritima

Table 2.5. Summary of habitat utilization by life history stage for species in the Spiny Lobster FMP. Habitats identified represent EFH under Alternative 6 for each species and life stage in the Spiny Lobster FMP.

Estuarine Habitat

SPECIES_SCI	Adults	Early	Late
		juveniles	juveniles
Panulirus argus	Seagrass	Benthic	Mangrove,
	es	algae	Seagrasses

Marine Habitat

SPECIES_ SCI	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Panulirus	Hard bottoms, Reef, Seagrasses	Benthic algae, Hard	Reef		,	algae,	Reef
Panulirus guttatus	Reef	Reef	Reef	Pelagic	Reef	Reef	Reef
Panulirus laevicauda	Reef						

Table 2.6. Summary of habitat utilization by life history stage for species in the Queen Conch FMP. Habitats identified by represent EFH under Alternative 6 for each species and life stage in the Queen Conch FMP.

Estuarine Habitat

SPECIES_SCI	Eggs
Cassis flammea	Seagrasses

Marine Habitat

SPECIES_SCI	Adults	Early	Eggs	Larvae	Late	Spawning
		juveniles			juveniles	adults
Astrea tuber	Reef	Reef			Reef	
Cassis flammea	Seagrasses					
Cassis	Seagrasses	Seagrasses			Seagrasses	
madagascarensis						
Cassis tuberosa	Hard	Seagrasses			Seagrasses	
	bottoms,					
	Seagrasses					
Charonia	Hard					
variegata	bottoms,					
	Sand/Shell					
0111	bottoms					
Cittarium pica	Hard	Hard			Hard	
Facility is C.P.	bottoms	bottoms			bottoms	
Fasciolaria tulipa	Hard					
	bottoms, Reef,					
	Seagrasses					
Strombus	Benthic	Benthic			Benthic	
costatus	algae, Hard				algae,	
Costatus	bottoms,	Seagrasses			Seagrasses	
	Seagrasses	Ocagrasses			Coagrasses	
Strombus gallus	Benthic					
Su om suo gamas	algae,					
	Seagrasses					
Strombus gigas	Benthic	Sand/Shell	Sand/S	Pelagic	Sand/Shell	Sand/Shell
	algae, Hard	bottoms	hell		bottoms,	bottoms,
	bottoms,		bottoms		Seagrasses	Seagrasses
	Reef,					
	Rubble,					
	Sand/Shell					
	bottoms,					
	Seagrasses					

Table 2.6. Summary of habitat utilization by life history stage for species in the Queen Conch FMP (Marine continued)

SPECIES_SCI	Adults	Early	Eggs	Larvae	Late	Spawning
		juveniles			juveniles	adults
Strombus pugilis	Benthic	Benthic			Benthic	
	algae, Hard	algae,			algae,	
	bottoms,	Seagrasses			Seagrasses	
	Seagrasses					
Strombus raninus	Seagrasses					
Vasum muricatum	Benthic					
	algae,					
	Seagrasses					

Table 2.7. Summary of habitat utilization by life history stage for species in the Reef Fish FMP. Habitats identified represent EFH under Alternative 6 for each species and life stage in the Reef Fish FMP.

Estuarine

SPECIES_	Adults	Early	Larvaa	Late juveniles	Postlarvae	Snowning
SCI	Addits	Early juveniles	Larvae	Late juvernies	rusiiaivae	Spawning adults
Abudefduf saxatilis	Mangrove					
Acanthurus	Mangrove					
bahianus						
Acanthurus	Mangrove					
chirurgus						
Acanthurus	Mangrove					
coeruleus	_					
Anisotremus	Mangrove	Mangrove		Mangrove,		
virginicus				Seagrasses		
Archosargus	Mangrove,	Seagrasses		Mangrove,	Seagrasses	
rhomboidalis	Seagrasses			Seagrasses		
Bodianus	Mangrove					
rufus						
Canthigaster	Seagrasses	Seagrasses		Seagrasses		
rostrata						
Caranx	Seagrasses			Seagrasses		
bartholomaei						
Caranx latus	Mangrove,					
_	Seagrasses					
Caranx ruber	Mangrove,					
	Seagrasses					
Chaetodon	Mangrove,			Mangrove,		
capistratus	Seagrasses			Seagrasses		
Chaetodon	Mangrove,					
striatus	Seagrasses					
Diodon hystix	Seagrasses			Seagrasses		
Epinephelus				Mangrove,		
cruentatus				Seagrasses		
Epinephelus				Mangrove,		
guttatus				Seagrasses		
Epinephelus	Artificial	,	Man-	Mangrove,	Mangrove	
itajara	structures	Seagrasses	•	Seagrasses		
Epinephelus		Seagrasses				
morio						
Epinephelus				Mangrove,		
striatus				Seagrasses		
Equetus	Seagrasses					
acuminatus						

(Estuarine conti						
SPECIES_	Adults	Early	Larvae	Late juveniles	Postlarvae	Spawning
SCI		juveniles				adults
Haemulon				Mangrove		
album						
Haemulon	Mangrove,	Mangrove,		Mangrove,		
aurolineatum	Seagrasses	Seagrasses		Seagrasses		
Haemulon	Mangrove,	Mangrove,		Mangrove,	Artificial	
flavolineatum	Seagrasses	Seagrasses		Seagrasses	reef,	
	_			_	Seagrasses	
Haemulon	Mangrove,	Mangrove,		Mangrove,	Seagrasses	
plumieri	Seagrasses	Seagrasses		Seagrasses		
Haemulon	Mangrove,	Mangrove,		Mangrove,	Seagrasses	
sciurus	Seagrasses	Seagrasses		Seagrasses		
	Mangrove			•		
garnoti	· ·					
	Seagrasses	Seagrasses		Seagrasses		
spp.	· ·					
	Mangrove					
rufus	· ·					
Lachnolaimus		Seagrasses		Seagrasses		
maximus						
Lactophrys	Seagrasses					
bicaudalis	Ö					
Lactophrys	Seagrasses					
quadricornis	· ·					
Lactophrys	Seagrasses					
trigonus	Ö					
	Mangrove,	Emergent		Emergent		
	Seagrasses	marshes,		marshes,		
	· ·	Mangrove,		Mangrove,		
		Seagrasses		Seagrasses		
Lutjanus	Artificial	Artificial		Artificial		
-	structures,	structures,		structures,		
•	Mangrove,	Mangrove,		Emergent		
	Seagrasses	Seagrasses		marshes,		
	· ·			Mangrove,		
				Seagrasses		
Lutjanus	Mangrove,	Emergent		Emergent	Seagrasses	
griseus	Sand/Shell	marshes,		marshes,		
•	bottoms,	Mangrove,		Mangrove,		
	Seagrasses	Seagrasses		Seagrasses		

(Estuarine continued)

(Estuarine conti						
SPECIES_	Adults	Early	Larvae	Late juveniles	Postlarvae	Spawning
SCI		juveniles				adults
Lutjanus jocu	Artificial	Mangrove,		Artificial		
	structures,	Seagrasses		structures,		
	Mangrove,			Mangrove,		
	Seagrasses			Seagrasses		
Lutjanus		Seagrasses		Mangrove,		
mahogoni				Seagrasses		
Lutjanus	Mangrove,	Mangrove,		Mangrove,	Seagrasses	
synagris	Seagrasses,	Sand/Shell		Sand/Shell		
	Soft bottoms	bottoms,		bottoms,		
		Seagrasses		Seagrasses,		
		, Soft		Soft bottoms		
		bottoms				
Microspathod	Mangrove					
on chrysurus						
Mulloidichthy	Mangrove					
s martinicus						
Mycteroperca		Seagrasses		Seagrasses		
venenosa						
Ocyurus	Artificial	Artificial		Artificial	Seagrasses	
chrysurus	structures,	structures,		structures,		
	Mangrove,	Mangrove,		Mangrove,		
	Seagrasses	Sand/Shell		Seagrasses		
		bottoms,				
		Seagrasses				
		, Soft				
		bottoms				
Pomacanthus	Mangrove,					
arcuatus	Seagrasses					
Pomacentrus	Mangrove					
leucostictus						
Pomacentrus	Mangrove					
partitus	9 - 1 - 3					
Pseudupeneu	Seagrasses					
s maculatus						
Rypticus				Mangrove,		
saponaceus				Seagrasses		
Scarus	Mangrove,					
croicensis	Seagrasses					
Scarus	Mangrove					
guacamaia	3.0.0					
Sparisoma	Mangrove,					
chrysopterum	Seagrasses					
o. ii y ooptoruiii	- Jugi added	l	l	l	ı	

Table 2.7. Summary of habitat utilization by life history stage for species in the Reef Fish FMP (Estuarine continued)

SPECIES_	Adults		Larvae	Late juveniles	Postlarvae	Spawning
SCI		juveniles				adults
Sparisoma	Mangrove					
viride	_					
Syngnathus	Seagrasses	Seagrasses		Seagrasses		
spp.						
Thalassoma	Mangrove					
bifasciatum						

Marine

SPECIES_SC		Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Abudefduf saxatilis	Artificial reef, Mangrove, Reef	Artificial reef, Mangrove, Reef			Artificial reef, Mangrove, Reef	Mangrove, Reef	
Acanthurus bahianus	Artificial reef, Mangrove, Reef, Rubble						
Acanthurus chirurgus	Mangrove, Reef						
Acanthurus coeruleus	Mangrove, Reef						
Aluterus scriptus	Reef						
Amblycirrhitus pinos	Reef						
Anisotremus virginicus	Hard bottoms, Reef, Rubble	Hard bottoms, Mangrove, Reef, Rubble			Mangrove, Reef, Seagrasses	Hard bottoms, Reef, Rubble	
Antennarius spp.	Hard bottoms, Reef						
Apogon maculatus	Reef						
Apsilus dentatus	Hard bottoms, Reef						

(Marine contin							-
SPECIES_SC	Adults	Early	Eggs	Larvae	Late	Postlarvae	Spawning adults
Archagaraus	Manarava	juveniles			juveniles	Coograsss	adults
Archosargus rhomboidalis	Mangrove, Reef,	Seagrasses			Mangrove, Reef,	Seagrasses	
momboldalis	,				,		
	Seagrasses				Seagrasses		
Astrapogon	Rubble,						
stellatus	Sand/Shell						
	bottoms,						
	Seagrasses						
Aulostomus	Reef						
maculatus							
Balistes	Reef,						
vetula	Rubble						
Bodianus	Artificial				Artificial reef,		
rufus	reef, Hard				Hard		
	bottoms,				bottoms,		
	Mangrove,				Mangrove		
	Reef						
Bothus	Reef,				Soft bottoms		
lunatus	Rubble,				Con Dottomo		
lanatao	Soft						
	bottoms						
Calamus	Reef,	Reef,			Reef,		
bajonado	Sand/Shell	Sand/Shell			Sand/Shell		
bajoriado	bottoms,	bottoms,			bottoms,		
	Seagrasses	Seagrasses			Seagrasses		
Calamus	Hard	Ocagrasses			Ocagrasses		
penna	bottoms,						
	Reef,						
	Sand/Shell						
	bottoms,						
	Seagrasses						
Calamus	Reef,						
pennatula	Rubble						
Cantherhines	Reef						
macrocerus							
Canthidermis	Reef						Reef
sufflamen							
Canthigaster	Reef,	Reef,			Reef,		
rostrata	Rubble,	Rubble,			Rubble,		
	Seagrasses				Seagrasses		
Caranx	Reef,	J			Reef,		
bartholomaei	Seagrasses				Seagrasses		
Caranx crysos					Reef, Rubble		
	Rubble						
L	. 155510	<u>I</u>		İ	<u> </u>	l	l

(Marine contin							
SPECIES_SC	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Caranx latus	Mangrove, Reef, Seagrasses	,			Reef		
Caranx lugubris	Pelagic, Reef						
Caranx ruber	Mangrove, Reef, Rubble, Seagrasses				Reef, Rubble		
Caulolatilus cyanops	Hard bottoms, Sand/Shell bottoms, Soft bottoms		Pelagic	Pelagic			
Centropyge argi	Reef						
Cephalopholis fulva	Artificial reef, Hard bottoms, Reef, Rubble, Sand/Shell bottoms, Seagrasses	Artificial reef, Benthic algae			Reef		Hard bottoms, Reef
Chaetodipteru s faber	Reef						
Chaetodon aculeatus	Reef, Rubble		Reef				Reef
Chaetodon capistratus	bottoms, Seagrasses	Artificial reef, Benthic algae, Reef, Seagrasses			Artificial reef, Mangrove, Reef, Seagrasses		Reef
Chaetodon ocellatus	Reef						
Chaetodon striatus	Mangrove, Reef, Rubble, Sand/Shell bottoms, Seagrasses		Pelagic	Pelagic			Reef
Chromis cyaneus	Reef	Reef			Reef	Reef	

(Marine continued)

(Marine contin							
SPECIES_SC	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Chromos	Reef	,					
insolatus							
Creole wrasse	Reef						
	Sand/Shell	Sand/Shell			Sand/Shell		
volitans	bottoms,	bottoms,			bottoms,		
Volitaris	Seagrasses	-			Seagrasses,		
	, Soft	, Soft			Soft bottoms		
	bottoms	bottoms			Con bottoms		
Diodon hystix	Hard	Dottoms			Hard		
Diodon nysux	bottoms,				bottoms,		
	Reef,				Reef,		
	Seagrasses				Seagrasses		
E aladata	-				Ocagrasses		
Echidna catenata	Reef						
Epinephelus	Hard	Artificial	Pelagic	Pelagic	Artificial reef		Hard
adscensionis	bottoms,	reef					bottoms,
	Reef						Reef
Epinephelus	Reef,				Mangrove,		Reef
cruentatus	Rubble				Reef,		
					Seagrasses		
Epinephelus	Hard		Pelagic	Pelagic	Hard		
flavolimbatus	bottoms				bottoms		
Epinephelus	Hard	Artificial	Pelagic	Pelagic	Hard	Reef	Reef
guttatus	bottoms,	reef,			bottoms,		
	Reef,	Rubble,			Mangrove,		
	Rubble,	Sand/Shell			Reef,		
	Sand/Shell	bottoms			Rubble,		
	bottoms				Sand/Shell		
					bottoms,		
					Seagrasses		
Epinephelus	Artificial	Mangrove,	Pelagic	Pelagic	Hard	Mangrove	Artificial
itajara	reef, Hard	Reef,	. Glagio	. Glagic	bottoms,	mang. 515	reef, Hard
l ajara	bottoms,	Seagrasses			Mangrove,		bottoms,
	Reef,	o agrasses			Reef,		Reef
	Shoals/Ban				Seagrasses		1.001
	ks				Coagracoco		
Epinephelus	Artificial	Hard	Pelagic	Pelagic	Hard		
morio	reef, Hard	bottoms,			bottoms,		
	bottoms,	Reef,			Reef		
	Reef	Seagrasses					
Epinephelus	Hard		Pelagic	Pelagic			Hard
mystacinus	bottoms		- 19.5				bottoms,
							Reef

(Marine contin							
SPECIES_SC I	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Epinephelus striatus	Artificial reef, Reef	Benthic algae, Reef, Seagrasses			Artificial reef, Mangrove, Reef, Seagrasses		Reef
Equetus acuminatus	Reef, Rubble, Seagrasses						
Equetus lanceolatus	Hard bottoms, Reef, Sand/Shell bottoms, Seagrasses	Hard bottoms, Reef, Sand/Shell bottoms, Seagrasses			Hard bottoms, Reef, Sand/Shell bottoms, Seagrasses		
Equetus punctatus	Reef						
Etelis oculatus	Bare sand, Hard bottoms		Pelagic	Pelagic	Hard bottoms		
Gobiosoma oceanops	Reef						
Gramma loreto	Reef						
Gymnothorax funebris	Reef						
Gymnothorax miliaris	Reef						
Haemulon album	Hard bottoms, Reef				Hard bottoms, Mangrove, Reef		
Haemulon aurolineatum	Rubble,	Artificial reef, Reef, Rubble, Seagrasses			Mangrove, Reef, Rubble, Seagrasses	Artificial reef, Reef, Rubble, Seagrasses	
Haemulon flavolineatum	Reef,	Artificial reef, Benthic algae, Mangrove, Reef, Rubble, Seagrasses		Pelagic	Artificial reef, Mangrove, Reef, Rubble, Seagrasses	Artificial reef, Benthic algae, Reef, Rubble, Seagrasses	

(Marine contin							
SPECIES_SC I	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Haemulon plumieri	Reef, Rubble, Seagrasses	Artificial reef, Mangrove, Reef, Rubble, Seagrasses			Artificial reef, Mangrove, Reef, Rubble, Seagrasses	reef, Reef, Rubble, Seagrasses	Reef
Haemulon sciurus	Reef, Rubble,	Mangrove, Reef, Rubble, Seagrasses			Mangrove, Reef, Rubble, Seagrasses	Reef, Rubble, Seagrasses	
Halichoeres cyanocephalu s	Reef						
Halichoeres garnoti	Artificial reef, Mangrove, Reef						
Halichoeres maculipinna	Reef, Rubble						
Halichoeres radiatus	Reef, Rubble						
us novacula	Rubble						
Hemipteronot us splendens							
Hippocampus spp.	Hard bottoms, Seagrasses	Hard bottoms, Seagrasses			Hard bottoms, Seagrasses		
Holacanthus ciliaris	Hard bottoms, Reef	Hard bottoms, Reef			Hard bottoms, Reef		
Holacanthus tricolor	Reef						
Holocentrus ascensionis	Reef						
Holocentrus rufus	Artificial reef, Mangrove, Reef						
Honeycomb cowfish	Reef, Rubble						
Lachnolaimus maximus	Artificial reef, Hard bottoms, Reef	Artificial reef, Seagrasses	Reef		Artificial reef, Seagrasses		Hard bottoms, Reef

(Marine contin	ued)						
SPECIES_SC I	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Lactophrys bicaudalis	Seagrasses						
Lactophrys quadricornis	Seagrasses						
Lactophrys trigonus	Seagrasses						
Lactophrys triqueter	Reef, Rubble						
Lutjanus analis	Benthic algae, Mangrove, Reef, Sand/Shell bottoms, Seagrasses	Mangrove, Reef, Seagrasses	Reef	Reef	Mangrove, Reef, Seagrasses	Reef	Reef, Shoals/Ba nks
Lutjanus apodus	Hard bottoms, Mangrove, Reef, Seagrasses	Hard bottoms, Mangrove, Reef, Seagrasses	Pelagic	Pelagic	Hard bottoms, Mangrove, Reef, Seagrasses		Reef
Lutjanus buccanella	Hard bottoms, Reef, Rubble	Artificial reef, Hard bottoms, Reef, Rubble	Pelagic		Hard bottoms, Reef, Rubble		Hard bottoms
Lutjanus griseus	Mangrove, Reef, Seagrasses	Mangrove, Reef, Seagrasses	Pelagic , Reef	Pelagic, Reef	Mangrove, Reef, Seagrasses	Seagrasses	Reef, Shoals/Ba nks
Lutjanus jocu	Hard bottoms, Mangrove, Reef, Seagrasses	Mangrove, Seagrasses	Pelagic	Pelagic	Hard bottoms, Mangrove, Reef, Seagrasses		Reef
Lutjanus mahogoni	bottoms,	Artificial reef, Benthic algae, Hard bottoms, Reef, Rubble, Seagrasses	Č	Pelagic	Artificial reef, Hard bottoms, Mangrove, Reef, Rubble, Seagrasses		

(Marine contin							
SPECIES_SC	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Lutionus	Artificial	Artificial	Dologia			Hord	Sand/Shel
Lutjanus synagris	reef, Hard bottoms, Mangrove, Reef, Sand/Shell bottoms, Seagrasses	reef, Hard bottoms, Mangrove, Reef, Sand/Shell bottoms, Seagrasses , Soft bottoms	Pelagic		Artificial reef, Hard bottoms, Mangrove, Reef, Sand/Shell bottoms, Seagrasses, Soft bottoms	hard bottoms, Reef, Seagrasses	Sand/Sheil I bottoms
Lutionus							
Lutjanus vivanus	Hard bottoms, Rubble, Sand/Shell bottoms, Soft bottoms						
Malacanthus plumieri	Rubble						
Melichthys	Reef,				Reef		
niger	Rubble						
on chrysurus	Reef	Reef			Reef	Reef	
Mulloidichthys martinicus	Mangrove, Reef, Rubble						
Mycteroperca tigris	Hard bottoms, Reef						Reef
Mycteroperca venenosa	Hard bottoms, Reef	Seagrasses			Hard bottoms, Reef, Seagrasses		Hard bottoms
Myrichthys oculatus	Reef, Sand/Shell bottoms, Seagrasses , Soft bottoms						
Myripristis jacobus	Reef						

(Marine contin							
SPECIES_SC I		Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Ocyurus chrysurus	bottoms, Mangrove, Reef, Rubble,	Artificial reef, Artificial structures, Hard bottoms, Mangrove, Reef, Rubble, Seagrasses , Soft bottoms	Pelagic		Artificial reef, Artificial structures, Hard bottoms, Mangrove, Reef, Rubble, Seagrasses	Artificial reef, Hard bottoms, Reef, Rubble, Seagrasses	
Ogcocephalus spp.	Hard bottoms, Reef, Seagrasses						
Ophioblennius atlanticus	Reef				Reef		
Opistognathu s aurifrons	Rubble						
Opistognathu s whitehursti	Rubble						
Paranthias furcifer	Reef						Reef
Pomacanthus arcuatus	Mangrove, Reef, Rubble, Seagrasses				Reef, Rubble		
Pomacanthus paru	Reef				Reef		
Pomacentrus fuscus	Reef						Reef
Pomacentrus leucostictus	Mangrove, Reef	Reef			Reef	Reef	Reef
Pomacentrus partitus	Artificial reef, Mangrove, Reef, Rubble	Reef, Rubble			Reef, Rubble		
Pomacentrus planifrons	Reef	Reef			Reef		Reef
Priacanthus arenatus	Hard bottoms, Reef	Hard bottoms, Reef			Hard bottoms, Reef		

(Marine continued)

(Marine contin							
SPECIES_SC	Adults	Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults
Priacanthus	Reef	,			J on 21 2		51010110
cruentatus							
Pristipomoide	Hard		Pelagic	Pelagic			Sand/
s	bottoms,		l clagio	lolagio			Shell
macrophtalmu	-						bottoms
S	Sand/Shell						Dottoms
3	bottoms						
Pseudupeneu	Reef,						
s maculatus	Rubble,						
	Seagrasses						
Rhomboplites	Artificial	Artificial			Artificial reef,		
aurubens	reef, Hard	reef, Hard			Hard		
	bottoms,	bottoms,			bottoms,		
	Reef	Reef			Reef		
Rypticus	Hard	Hard			Hard		
saponaceus	bottoms,	bottoms,			bottoms,		
Caponacoac	Reef	Reef			Mangrove,		
	11001	11001			Reef,		
					Seagrasses		
Scarus	Reef				Coagracooc		
coelestinus							
Scarus	Hard	Hard			Hard		
coeruleus	bottoms,	bottoms,			bottoms,		
	Reef,	Reef,			Reef,		
	,	Seagrasses			Seagrasses		
Scarus	Artificial	J			<u> </u>		
croicensis	reef,						
0.0.001.0.0	Mangrove,						
	Reef,						
	Rubble,						
	Seagrasses						
Scarus	Mangrove,						
guacamaia	Reef						
Scarus	Reef						
taeniopterus							
Scarus vetula	Reef						
Scorpaenidae	Hard	Hard			Hard		
nei	bottoms,	bottoms,			bottoms,		
	Reef	Reef			Reef		
Seriola	Pelagic,	Drift Algae	Pelagic	Pelagic	Drift Algae	Pelagic	Pelagic
dumerili	Reef	3.13	2 2.3.0		3.3		
Seriola	Pelagic	Drift Algae	Pelagic		Drift Algae		Pelagic
rivoliana							
•	•	•	•	•	•		

	(Marine continued)									
SPECIES_SC I		Early juveniles	Eggs	Larvae	Late juveniles	Postlarvae	Spawning adults			
Serranus annularis	Hard bottoms, Reef									
Serranus baldwini	Rubble	Artificial reef								
Serranus tabacarius	Reef, Rubble	Artificial reef								
Serranus tigrinus	Hard bottoms, Reef	Artificial reef								
Serranus tortugarum	Rubble									
Sparisoma aurofrenatum	Reef									
Sparisoma chrysopterum	Artificial reef, Mangrove, Reef, Seagrasses									
Sparisoma rubripinne	Reef									
Sparisoma viride	Artificial reef, Mangrove, Reef									
Syngnathus spp.	Seagrasses	Seagrasses			Seagrasses					
Synodus intermedius	Rubble									
Thalassoma bifasciatum	Artificial reef, Mangrove, Reef, Rubble	Reef, Rubble			Reef, Rubble	Reef, Rubble	Reef			
Xanthichthys ringens	Reef									

Table 2.8. Habitat use by species/life stages of Caribbean FMP species

Estuarine: Reef Fish FMP

SPECIES_SCI	Artificial reef	Artificial structures	Emergent marshes	Mangrove	Sand/Shell bottoms	Seagrasses	Soft bottoms
Abudefduf saxatilis				Adults			
Acanthurus bahianus				Adults			
Acanthurus chirurgus				Adults			
Acanthurus coeruleus				Adults			
Anisotremus virginicus				Adults, Early juveniles, Late juveniles		Late juveniles	
Archosargus rhomboidalis				Adults, Late juveniles		Adults, Early juveniles, Late juveniles, Postlarvae	
Bodianus rufus				Adults			
Canthigaster rostrata						Adults, Early juveniles, Late juveniles	

SPECIES_SCI	Artificial	Emergent	Mangrove	Sand/Shell	Seagrasses	Soft
	structures	marshes		bottoms		bottoms
Caranx					Adults, Late	
bartholomaei					juveniles	
Caranx latus			Adults		Adults	
Caranx ruber			Adults		Adults	
Chaetodon			Adults, Late		Adults, Late	
capistratus			juveniles		juveniles	
Chaetodon			Adults		Adults	
striatus						
Diodon hystix					Adults, Late	
					juveniles	
Epinephelus			Late juveniles		Late juveniles	
cruentatus						
Epinephelus			Late juveniles		Late juveniles	
guttatus						
Epinephelus	Adults		Early		Early	
itajara			juveniles,		juveniles,	
			Larvae, Late		Late juveniles	
			juveniles,			
			Postlarvae			
Epinephelus					Early	
morio					juveniles	
Epinephelus			Late juveniles		Late juveniles	
striatus			-		-	
Equetus					Adults	
acuminatus						
Haemulon			Late juveniles			
album						

SPECIES SCI		Artificial	Emorgant	Mangrove	Sand/Shell	Songraceoe	Soft
SPECIES_SCI	Artificial reel	structures	Emergent marshes	Iviarigiove	bottoms	Seagrasses	bottoms
l le a reculere		Structures	maisnes	A de da . E a ale e	DOLLOTTIS	A dulta Fambr	DOLLOTTIS
Haemulon				Adults, Early		Adults, Early	
aurolineatum				juveniles, Late		juveniles,	
				juveniles		Late juveniles	
Haemulon	Postlarvae			Adults, Early		Adults, Early	
flavolineatum				juveniles, Late		juveniles,	
				juveniles		Late	
						juveniles,	
						Postlarvae	
Haemulon				Adults, Early		Adults, Early	
plumieri				juveniles, Late		juveniles,	
				juveniles		Late	
						juveniles,	
						Postlarvae	
Haemulon				Adults, Early		Adults, Early	
sciurus				juveniles, Late		juveniles,	
				juveniles		Late	
						juveniles,	
						Postlarvae	
Halichoeres				Adults			
garnoti							
Hippocampus						Adults, Early	
spp.						juveniles,	
						Late juveniles	
Holocentrus				Adults			
rufus							

SPECIES_SCI	Artificial structures	Emergent marshes	Mangrove	Sand/Shell bottoms	Seagrasses	Soft bottoms
Lachnolaimus maximus					Early juveniles, Late juveniles	
Lactophrys bicaudalis					Adults	
Lactophrys quadricornis					Adults	
Lactophrys trigonus					Adults	
Lutjanus analis		_	Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles	
Lutjanus apodus	Adults, Early juveniles, Late juveniles	Late juveniles	Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles	
Lutjanus griseus		Early juveniles, Late juveniles	Adults, Early juveniles, Late juveniles	Adults	Adults, Early juveniles, Late juveniles, Postlarvae	
Lutjanus jocu	Adults, Late juveniles		Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles	

SPECIES_SCI	 Artificial structures	Emergent marshes	Mangrove	Sand/Shell bottoms	J	Soft bottoms
Lutjanus mahogoni			Late juveniles		Early juveniles, Late juveniles	
Lutjanus synagris			Adults, Early juveniles, Late juveniles	Early juveniles, Late juveniles	Adults, Early juveniles, Late juveniles, Postlarvae	Adults, Early juveniles, Late juveniles
Microspathodo n chrysurus			Adults			
Mulloidichthys martinicus			Adults			
Mycteroperca venenosa					Early juveniles, Late juveniles	
Ocyurus chrysurus	Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles	Early juveniles	Adults, Early juveniles, Late juveniles, Postlarvae	Early juveniles
Pomacanthus arcuatus			Adults		Adults	
Pomacentrus leucostictus			Adults			
Pomacentrus partitus			Adults			

SPECIES_SCI	Artificial reef	Artificial	Emergent	Mangrove	Sand/Shell	Seagrasses	Soft
		structures	marshes		bottoms		bottoms
Pseudupeneu						Adults	
s maculatus							
Rypticus				Late juveniles		Late juveniles	
saponaceus							
Scarus				Adults		Adults	
croicensis							
Scarus				Adults			
guacamaia							
Sparisoma				Adults		Adults	
chrysopterum							
Sparisoma				Adults			
viride							
Syngnathus						Adults, Early	
spp.						juveniles,	
						Late juveniles	
Thalassoma				Adults			
bifasciatum							

Estuarine: Spiny Lobster FMP

SPECIES_SCI	Benthic algae	Mangrove	Seagrasses
Panulirus argus	Early	Late juveniles	Adults, Late
	juveniles		juveniles

Estuarine: Queen Conch FMP

SPECIES_SCI	Seagrasses
Cassis	Eggs
flammea	

Table 2.8. Habitat use by species/life stages of Caribbean FMP species

Marine: Reef Fish FMP

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Abudefduf saxatilis	Adults, Early juveniles, Late juveniles						Adults, Early juveniles, Late juveniles, Postlarv.		Adults, Early juveniles, Late juveniles, Postlarv.					
Acanthurus bahianus	Adults						Adults		Adults	Adults				
Acanthurus chirurgus							Adults		Adults					
Acanthurus coeruleus							Adults		Adults					
Aluterus scriptus									Adults					
Amblycirrhitus pinos									Adults					
Anisotremus virginicus									Early juveniles,	Adults, Early juveniles, Postlarv.		Late juveniles		
Antennarius spp.						Adults			Adults					
Apogon maculatus									Adults					
Apsilus dentatus						Adults			Adults					
Archosargus rhomboidalis							Adults, Late juveniles		Adults, Late juveniles			Adults, Early juveniles, Late juveniles, Postlarv.		

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Astrapogon stellatus										Adults	Adults	Adults		
Aulostomus maculatus									Adults					
Balistes vetula									Adults	Adults				
Bodianus rufus	Adults, Late juveniles					Adults, Late juveniles	Adults, Late juveniles		Adults					
Bothus lunatus									Adults	Adults				Adults, Late juveniles
Calamus bajonado									Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles	Adults, Early juveniles, Late juveniles		
Calamus penna						Adults			Adults		Adults	Adults		
Calamus pennatula									Adults	Adults				
Cantherhines macrocerus									Adults					
Canthidermis sufflamen									Adults, Spawnin g adults					
Canthigaster rostrata									Late	Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles		
Caranx bartholomaei									Adults, Late juveniles			Adults, Late juveniles		

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Caranx crysos									Adults, Late juveniles	Adults, Late juveniles				
Caranx latus							Adults		Adults, Late juveniles			Adults		
Caranx lugubris								Adults	Adults					
Caranx ruber							Adults		Adults, Late juveniles	Adults, Late juveniles		Adults		
Caulolatilus cyanops						Adults		Eggs, Larvae			Adults			Adults
Centropyge argi									Adults					
Cephalopholis fulva	Adults, Early juveniles			Early juveniles		Adults, Spawnin g adults			Adults, Late juveniles, Spawnin g adults	Adults	Adults	Adults		
Chaetodipterus faber									Adults					
Chaetodon aculeatus									Adults, Eggs, Spawnin g adults	Adults				
Chaetodon capistratus	Early juveniles, Late juveniles			Early juveniles			Adults, Late juveniles		Adults, Early juveniles, Late juveniles, Spawnin g adults	Adults	Adults	Adults, Early juveniles, Late juveniles		

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Chaetodon ocellatus									Adults					
Chaetodon striatus							Adults	Eggs, Larvae	Adults, Spawnin g adults	Adults	Adults	Adults		
Chromis cyaneus									Adults, Early juveniles, Late juveniles, Postlarv.					
Chromos insolatus									Adults					
Creole wrasse									Adults					
Dactylopterus volitans											Adults, Early juveniles, Late juveniles	Late		Adults, Early juveniles, Late juveniles
Diodon hystix						Adults, Late juveniles			Adults, Late juveniles			Adults, Late juveniles		
Echidna catenata									Adults					
adscensionis	Early juveniles, Late juveniles					Adults, Spawnin g adults		Eggs, Larvae	Adults, Spawnin g adults					
Epinephelus cruentatus							Late juveniles		Adults, Late juveniles, Spawnin g adults	Adults		Late juveniles		

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand		Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Epinephelus flavolimbatus						Adults, Late juveniles		Eggs, Larvae						
Epinephelus guttatus	Early juveniles					Adults, Late juveniles	Late juveniles	Eggs, Larvae	Late juveniles, Postlarv.,		Adults, Early juveniles, Late juveniles	Late juveniles		
Epinephelus itajara	Adults, Spawnin g adults					Late juveniles, Spawnin	Early juveniles, Late juveniles, Postlarv.	Eggs, Larvae	Adults, Early juveniles, Late juveniles, Spawnin g adults			Early juveniles, Late juveniles	Adults	
Epinephelus morio	Adults					Adults, Early juveniles, Late juveniles		Eggs, Larvae	Adults, Early juveniles, Late juveniles			Early juveniles		
Epinephelus mystacinus						Adults, Spawnin g adults		Eggs, Larvae	Spawnin g adults					
Epinephelus striatus	Adults, Late juveniles			Early juveniles			Late juveniles		Adults, Early juveniles, Late juveniles, Spawnin g adults			Early juveniles, Late juveniles		

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Equetus acuminatus								Adults	Adults		Adults		
Equetus lanceolatus					Adults, Early juveniles, Late juveniles			Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles	Adults, Early juveniles, Late juveniles		
Equetus punctatus								Adults					
Etelis oculatus			Adults		Adults, Late juveniles		Eggs, Larvae						
Gobiosoma oceanops								Adults					
Gramma loreto								Adults					
Gymnothorax funebris								Adults					
Gymnothorax miliaris								Adults					
Haemulon album						Late juveniles		Adults, Late juveniles					
Haemulon aurolineatum	Early juveniles, Postlarv.					Adults, Late juveniles		Early juveniles, Late	Late juveniles,		Adults, Early juveniles, Late juveniles, Postlarv.		

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove		Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Haemulon flavolineatum	Adults, Early juveniles, Late juveniles, Postlarv.			Early juveniles, Postlarv.			Adults, Early juveniles, Late juveniles	Larvae	Late	Adults, Early juveniles, Late juveniles, Postlarv.		Adults, Early juveniles, Late juveniles, Postlarv.		
Haemulon plumieri	Adults, Early juveniles, Late juveniles, Postlarv.						Adults, Early juveniles, Late juveniles		Late juveniles,	Adults, Early juveniles, Late juveniles, Postlarv.		Adults, Early juveniles, Late juveniles, Postlarv.		
Haemulon sciurus							Adults, Early juveniles, Late juveniles		juveniles, Late	Adults, Early juveniles, Late juveniles, Postlarv.		Adults, Early juveniles, Late juveniles, Postlarv.		
Halichoeres cyanocephalus									Adults					
Halichoeres garnoti	Adults						Adults		Adults					

SPECIES_SCI	Artificial	Artificial	Bare sand	Benthic	Drift Algae	Hard	Mangrove	Reef	Rubble	Sand/	Seagrasses		Soft
	reef	structures		algae		bottoms				Shell bottoms		Banks	bottoms
Halichoeres maculipinna								Adults	Adults				
Halichoeres								Adults	Adults				
radiatus									Λ allt a				<u> </u>
Hemipteronotus novacula									Adults				
Hemipteronotus splendens									Adults				
Hippocampus spp.						Adults, Early juveniles, Late juveniles					Adults, Early juveniles, Late juveniles		
Holacanthus ciliaris						Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Late juveniles					
Holacanthus tricolor								Adults					
Holocentrus ascensionis								Adults					
Holocentrus rufus	Adults						Adults	Adults					
Honeycomb cowfish								Adults	Adults				
Lachnolaimus maximus	Adults, Early juveniles, Late juveniles					Adults, Spawning adults		Adults, Eggs, Spawning adults			Early juveniles, Late juveniles		
Lactophrys bicaudalis											Adults		
Lactophrys quadricornis											Adults		

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Lactophrys trigonus												Adults		
Lactophrys triqueter									Adults	Adults				
Lutjanus analis				Adults			Adults, Early juveniles, Late juveniles		Adults, Early juveniles, Eggs, Larvae, Late juveniles, Postlarv., Spawnin g adults		Adults		Spawnin g adults	
Lutjanus apodus						juveniles, Late		Eggs, Larvae	Adults, Early juveniles, Late juveniles, Spawnin g adults			Adults, Early juveniles, Late juveniles		
Lutjanus buccanella	Early juveniles					Adults, Early juveniles, Late juveniles, Spawnin g adults		Eggs	Early	Adults, Early juveniles, Late juveniles				

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Lutjanus griseus							Adults, Early juveniles, Late juveniles	Eggs, Larvae	Adults, Early juveniles, Eggs, Larvae, Late juveniles, Spawnin g adults				Spawnin g adults	
Lutjanus jocu							Adults, Early juveniles, Late juveniles	Eggs, Larvae	Adults, Late juveniles, Spawnin g adults			Adults, Early juveniles, Late juveniles		
maĥogoni	Adults, Early juveniles, Late juveniles			Early juveniles		Adults, Early juveniles, Late juveniles	Late juveniles	Eggs, Larvae		Adults, Early juveniles, Late juveniles	Adults	Adults, Early juveniles, Late juveniles		
	Adults, Early juveniles, Late juveniles					Early juveniles,	Early juveniles, Late	Eggs	Adults, Early juveniles, Late juveniles, Postlarv.		juveniles, Late	Early juveniles, Late juveniles,		Adults, Early juveniles, Late juveniles

SPECIES_SCI	Artificial	Artificial	Bare sand	Benthic	Drift Algae	Hard	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell	Seagrasses	Shoals /	Soft
	reef	structures		algae		bottoms					bottoms		Banks	bottoms
Lutjanus vivanus						Adults				Adults	Adults			Adults
Malacanthus										Adults				
plumieri														
Melichthys niger									Adults,	Adults				
									Late					
									juveniles					
Microspathodon							Adults		Adults,					
chrysurus									Early					
									juveniles,					
									Late					
									juveniles,					
									Postlarv.					
Mulloidichthys							Adults		Adults	Adults				
martinicus														
Mycteroperca						Adults			Adults,					
tigris									Spawning					
									adults					
Mycteroperca						Adults,			Adults,			Early		
venenosa						Late			Late			juveniles,		
						juveniles,			juveniles			Late		
						Spawning						juveniles		
NA						adults			A -111-		A -1 -11 -	A -1 -11 -		Λ -1 -14 -
Myrichthys oculatus									Adults		Adults	Adults		Adults
Myripristis									Adults					
jacobus									Addito					
Ocyurus	Adults,	Adults,				Adults,	Adults,	Eggs	Adults,	Adults,		Adults,	Adults	Early
chrysurus		Early				Early	Early		Early	Early		Early		juvenil
-	juveniles,					juveniles,	juveniles,		juveniles,	juveniles,		juveniles,		es
	Late	Late				Late	Late		Late	Late		Late		
	juveniles,	juveniles					juveniles		juveniles,	juveniles,		juveniles,		
	Postlarv.					Postlarv.			Postlarv.	Postlarv.		Postlarv.		

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Ogcocephalus spp.					Adults			Adults			Adults		
Ophioblennius atlanticus								Adults, Late juveniles					
Opistognathus aurifrons									Adults				
Opistognathus whitehursti									Adults				
Paranthias furcifer								Adults, Spawnin g adults					
Pomacanthus arcuatus						Adults		Adults, Late juveniles	Adults, Late juveniles		Adults		
Pomacanthus paru								Adults, Late juveniles					
Pomacentrus fuscus								Adults, Spawnin g adults					
Pomacentrus leucostictus						Adults		Adults, Early juveniles, Late juveniles, Postlarv., Spawnin g adults					

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Pomacentrus partitus	Adults						Adults		Adults, Early juveniles, Late juveniles	Late				
Pomacentrus planifrons									Adults, Early juveniles, Late juveniles, Spawnin g adults					
Priacanthus arenatus						Adults, Early juveniles, Late juveniles			Adults, Early juveniles, Late juveniles					
Priacanthus cruentatus									Adults					
Pristipomoides macrophtalmus						Adults		Eggs, Larvae		Adults	Adults, Spawnin g adults			
Pseudupeneus maculatus									Adults	Adults		Adults		
Rhomboplites aurubens	Adults, Early juveniles, Late juveniles					Adults, Early juveniles, Late juveniles			Adults, Early juveniles, Late juveniles					

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Rypticus saponaceus							Late juveniles		Adults, Early juveniles, Late juveniles			Late juveniles		
Scarus coelestinus									Adults					
Scarus coeruleus						Adults, Early juveniles, Late juveniles			Adults, Early juveniles, Late juveniles			Adults, Early juveniles, Late juveniles		
Scarus croicensis	Adults						Adults		Adults	Adults		Adults		
Scarus guacamaia							Adults		Adults					
Scarus taeniopterus									Adults					
Scarus vetula									Adults					
Scorpaenidae nei						Adults, Early juveniles, Late juveniles			Adults, Early juveniles, Late juveniles					

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Seriola dumerili					Early juveniles, Late juveniles			Adults, Eggs, Larvae, Postlarv., Spawnin g adults	Adults					
Seriola rivoliana					Early juveniles, Late juveniles			Adults, Eggs, Spawnin g adults						
Serranus annularis						Adults			Adults					
Serranus baldwini	Early juveniles									Adults				
Serranus tabacarius	Early juveniles								Adults	Adults				
Serranus tigrinus	Early juveniles					Adults			Adults					
Serranus tortugarum										Adults				
Sparisoma aurofrenatum									Adults					
Sparisoma chrysopterum	Adults						Adults		Adults			Adults		
Sparisoma rubripinne									Adults					
Sparisoma viride	Adults						Adults		Adults					

SPECIES_SCI	Artificial reef	Artificial structures	Bare sand	Benthic algae	Drift Algae	Hard bottoms	Mangrove	Pelagic	Reef	Rubble	Sand/ Shell bottoms	Seagrasses	Shoals / Banks	Soft bottoms
Syngnathus spp.												Adults, Early juveniles, Late juveniles		
Synodus intermedius										Adults				
Thalassoma bifasciatum	Adults						Adults		Early juveniles, Late	Adults, Early juveniles, Late juveniles, Postlarv.				
Xanthichthys ringens				_					Adults					

Marine: Spiny Lobster FMP

SPECIES_SCI	Benthic algae	Hard bottoms	Mangrov	Pelagic	Reef	Seagrasses
Panulirus argus		Adults, Early juveniles	Late juveniles	Larvae	Adults, Early juveniles, Eggs, Late juveniles, Spawning adults	Adults, Late juveniles, Postlarvae
Panulirus guttatus				Larvae	Adults, Early juveniles, Eggs, Late juveniles, Postlarvae, Spawning adults	
Panulirus laevicauda					Adults	

Marine: Queen Conch FMP

SPECIES_SCI	Benthic algae	Hard bottoms	Pelagic	Reef	Rubble	Sand/Shell bottoms	Seagrasses
Astrea tuber	J			Adults, Early juveniles, Late juveniles			
Cassis flammea							Adults
Cassis madagascarensis							Adults, Early juveniles, Late juveniles
Cassis tuberosa		Adults					Adults, Early juveniles, Late juveniles
Charonia variegata		Adults				Adults	
Cittarium pica		Adults, Early juveniles, Late juveniles					
Fasciolaria tulipa		Adults		Adults			Adults
Strombus costatus	Adults, Early juveniles, Late juveniles	Adults					Adults, Early juveniles, Late juveniles
Strombus gallus	Adults						Adults

SPECIES_SCI	Benthic algae	Hard bottoms	Pelagic	Reef	Rubble	Sand/Shell bottoms	Seagrasses
Strombus gigas	Adults	Adults	Larvae	Adults	Adults	Adults, Early juveniles, Eggs, Late juveniles, Spawning adults	Adults, Late juveniles, Spawning adults
Strombus pugilis	Adults, Early juveniles, Late juveniles	Adults					Adults, Early juveniles, Late juveniles
Strombus raninus							Adults
Vasum muricatum	Adults						Adults

Table 2.9. Allowable fishing gears in the Caribbean Council Fishery Management Plans.

Caribbean Fish	ery Management Council
Fishery	Allowable Gear Types
Caribbean Spiny Lobster FMP:	
A. Trap/pot fishery	A. Trap/pot
B. Dip net fishery	B. Dip net
C. Entangling net fishery	C. Gillnet, trammel net
D. Recreational fishery	D. Dip net, trap, pot, gillnet, trammel net
Caribbean Shallow Water Reef Fish FM	P:
A. Longline/hook and line fishery	A. Longline, hook and line.
B. Trap/pot fishery	B. Trap, pot.
C. Entangling net fishery	C. Gillnet, trammel net
D. Recreational fishery	D. Dip net, handline, rod and reel, slurp gun, spear
Coral and Reef Resources FMP:	
A. Commercial fishery	A. Dip net, slurp gun.
B. Recreational fishery	B. Dip net, slurp gun
Queen Conch FMP:	
A. Commercial fishery	A. Hand harvest only
B. Recreational fishery	B. Hand harvest only

Table 2.10. CFMC History of Fisheries Habitat Conservation

NAME OF AREA	Jurisdiction	Area (n/m ²)	Closed since	Species	Season
Hind Bank	Federal	16	1990	Red Hind	Dec-Feb
St. Thomas		16	1999	All Species	Year-round
Tourmaline	Federal/State	15	1993	Red Hind	Dec-Feb
Puerto Rico		9	1996	All Species	Dec-Feb
Lang Bank	Federal	~3	1993	Red Hind	Dec-Feb
St. Croix				All Species	
Mutton Area	Federal/State	~2	1993	Mutton	Mar-Jun
St. Croix				Snapper	
Bajo de Cico	Federal/State	9	1996	Red Hind	Dec-Feb
Puerto Rico				All Species	
Abrir La Sierra	Federal/State	9	1996	Red Hind	Dec-Feb
Puerto Rico				All Species	

Table 2.11. Total catch by gear from Puerto Rico (data from Matos-Caraballo 2001)

	•	J		`				
		Year						
	1998	1999	2000	Average	Rank	Rate		
Vertical Gear	942	950	969	954	1	High = 3		
Trap/Pots	766	724	659	716	2	High = 3		
Gill Nets	650	630	564	615	3	High = 3		
Hand Harvest	438	379	475	431	4	Moderate = 2		
Spear	190	174	215	193	5	Moderate = 2		
Longline	55	66	67	63	6	Moderate = 2		
Slurp Gun*	<5	<5	<5	<5	7	Low = 1		
Dip Nets*	<5	<5	<5	<5	8	Low = 1		
*The total harv	The total harvest of ornamentals averages less than 30,000 individual/year 1998-2000.							

Table 2.12. Possible actions to minimize fishing impacts on EFH from gears used in fisheries managed by a Caribbean FMP.

Longline	hook & line (bandit rig or rod & reel)	trap/pot	gill & trammel net	Spear	dip net	hand harvest
No restrictions	No restrictions	No restrictions	No restrictions	no restrictions	No restrictions	No restrictions
Limit gear to 500 feet on coral or hard/live bottom habitat	Require use of circle hooks	Restrict traps and pots to a single gear per buoy		Reduce fishing effort by x, y, or z percent	Reduce fishing effort by x, y, or z percent	Reduce fishing effort by x, y, or z percent
Limit gear length to 500'		Require buoys on all traps/pots	Reduce fishing effort by x, y, or z percent	Establish time or area closure that restricts fishing activity by x, y, or z percent	Establish time or area closure that restricts fishing activity by x, y, or z percent	Establish time or area closure that restricts fishing activity by x, y, or z percent
Reduce fishing effort by x, y, or z percent	Reduce fishing effort by x, y, or z percent	from the fishing ground to land- based storage at the	Establish time or area closure that restricts fishing activity by x, y, or z percent	Prohibit use of Scuba while spearfishing	Prohibit on coral or hard/live bottom habitat	Prohibit on coral or hard/live bottom habitat
area closure that restricts fishing activity by x, y, or z percent	area closure that restricts fishing activity by x, y, or z percent	effort by x, y, or z percent	coral habitat	Prohibit on coral or hard/live bottom habitat		
Prohibit on coral or hard/live bottom habitat	on coral or hard/live bottom habitat while fishing with vertical	area closure that	Prohibit in the Caribbean EEZ			

Longline	hook & line (bandit rig or rod & reel)	trap/pot	gill & trammel net	Spear	dip net	hand harvest
Prohibit in the Caribbean EEZ	Prohibit on coral or hard/live bottom	Prohibit on coral or hard/live bottom or SAV habitat within a 500 ft buffer				
	Prohibit in the Caribbean EEZ	Prohibit on coral or hard/live bottom or SAV habitat				
		Prohibit in the Caribbean EEZ				

Table 2.13 Comparison of US Caribbean EFH Alternatives

Table 2.13a. Comparison of Spiny Lobster FMP EFH Alternatives

Affec Enviro	nment	Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the spiny lobster FMP	for the spiny lobster fishery consists of areas where various life stages of spiny lobster commonly occur	Alternative 6. (Preferred Alternative). EFH for the spiny lobster fishery in the US Caribbean consists of all waters and seagrass, benthic algae, mangrove, coral, and live hard bottom substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for spiny lobster consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
	Puerto Rico	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts, but some indirect impacts because EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment
Physical	USVI	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts, but some indirect impacts because EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment

<u> </u>	able 2.	13a. Cor	nparison of Spiny	Lobster FMP EFH	Alternatives Continued	
	Affe		Alternative 1. (No	Alternative 2.	Alternative 6. (Preferred	Alternative 8. EFH for
	Enviro	nment	Action – roll back)	(Status Quo) EFH	Alternative). EFH for the	spiny lobster consists
			Do not describe	for the spiny		of a discontinuous
			and identify EFH	lobster fishery	US Caribbean consists of	band of waters and
			in the US	consists of areas	all waters and seagrass,	substrates around St.
			Caribbean for the	where various life	benthic algae, mangrove,	John from mean high
			spiny lobster FMP	stages of spiny	coral, and live hard bottom	
				lobster commonly	substrates from mean high	25 M
				occur	water to the outer	
-			N. P. C.	N. P. C.	boundary of the EEZ	NI P C C
		Ocean	No direct impacts,	No direct impacts	No direct impacts and little	
		water	but some indirect	and no change in	change in indirect impacts	but some indirect
		charac- teristics	impacts because	indirect impacts from the current	from the current situation because EFH would be	impacts because EFH would be
		tensucs	EFH previously described and	situation.	essentially the same as	smaller than at
			identified would	Protection from	status quo. Protection	present, resulting in
			be voided,	Federal activities	from Federal activities and	
			resulting in	and activities	activities requiring Federal	
			potentially less	requiring Federal	permits that might impact	Federal activities and
			protection from	permits that might	water quality would be the	
			Federal activities	impact water	same as at present	Federal permits that
			and activities	quality would be	Joanna de de processi	might impact water
			requiring Federal	the same as at		quality
			permits that might	present		' '
			impact water			
	Biolog-		quality			
	cal	Estuar-	No direct impacts,	No direct impacts	No direct impacts and little	
10	Jai	ine	but some indirect	and no change in		but some indirect
			impacts because	indirect impacts	from the current situation.	impacts because
			areas described	from the current	Areas described and	areas described and
			and identified as	situation. Areas	identified as EFH would	identified as EFH
			EFH previously	described and	essentially be the same as	
			would no longer	identified as EFH	at present, so protection	than at present,
			be considered	would be the same	from Federal activities and	
			EFH, resulting in	as at present, so		potentially less
			less protection from Federal	protection from	permits that might impact	protection from
			activities and	Federal activities and activities	estuarine habitats would change very little	Federal activities and activities requiring
			activities requiring	requiring Federal	lonange very mue	Federal permits that
			Federal permits	permits that might		might impact
			that might impact	impact estuarine		estuarine habitats
			estuarine habitats	habitats would not		octadinio nabitato
				change		

Table 2.	13a. Coi		Lobster FMP EFH	Alternatives Continued	
Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the spiny lobster FMP	Alternative 2. (Status Quo) EFH for the spiny lobster fishery consists of areas where various life stages of spiny lobster commonly occur	Alternative 6. (Preferred Alternative). EFH for the spiny lobster fishery in the US Caribbean consists of all waters and seagrass, benthic algae, mangrove, coral, and live hard bottom substrates from mean high water to the outer	•
			occui	boundary of the EEZ	
Biolog-	Marine	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact marine habitats	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact marine habitats would not change	Areas described and identified as EFH would essentially be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact marine habitats would change very little	but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact marine habitats
ical	Environ mental sites of special interest	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest would not change	, ,	but some indirect impacts because areas described and identified as EFH

Table 2.13a. Comparison of Spiny Lobster FMP EFH Alternatives Continued						
Affe	cted	Alternative 1. (No	Alternative 2.	Alternative 6. (Preferred	Alternative 8. EFH for	
Enviro	nment	Action – roll back)	(Status Quo) EFH	Alternative). EFH for the	spiny lobster consists	
		Do not describe	for the spiny	, ,	of a discontinuous	
		and identify EFH	lobster fishery		band of waters and	
		in the US	consists of areas	,	substrates around St.	
		Caribbean for the	where various life		John from mean high	
		spiny lobster FMP	stages of spiny	coral, and live hard bottom		
			lobster commonly	substrates from mean high	25 m	
			occur	water to the outer		
	1			boundary of the EEZ		
	Fishery	No direct impacts,	No direct impacts	No direct impacts and little		
	res-	but some indirect	and no change in	change in indirect impacts	but some indirect	
	ources	impacts because	indirect impacts	from the current situation.	impacts because	
	under	areas described	from the current	Areas described and	areas described and	
	FMPs	and identified as	situation. Areas	identified as EFH would	identified as EFH	
		EFH previously	described and	be essentially the same as		
		would no longer	identified as EFH		than at present,	
		be considered	would be the same	from Federal activities and		
		EFH, resulting in	as at present, so		potentially less	
		less protection	protection from	permits that might impact	protection from	
		from Federal	Federal activities	habitats used by FMP	Federal activities and	
		activities and	and activities	species would not change	activities requiring	
		activities requiring	requiring Federal		Federal permits that	
		Federal permits	permits that might		might impact habitats	
		that might impact habitats used by	impact habitats		used by FMP species	
		FMP species	used by FMP species would not			
Human		i wir species	change			
Environ-	Fishery	No direct impacts,	No direct impacts	No direct impacts and little	No direct impacts	
ment	res-	but some indirect	and no change in	change in indirect impacts		
	ources	impacts because	indirect impacts		impacts because	
	not		from the current	Areas described and	areas described and	
	under	and identified as	situation. Areas		identified as EFH	
	Caribb-	EFH previously	described and	be essentially the same as		
	ean	would no longer	identified as EFH	at present, so protection	than at present,	
	Council	be considered	would be the same	from Federal activities and		
	FMPs	EFH, resulting in	as at present, so		potentially less	
		less protection	protection from		protection from	
		from Federal	Federal activities	habitats used by non-FMP	Federal activities and	
		activities and	and activities		activities requiring	
		activities requiring	requiring Federal		Federal permits that	
		Federal permits	permits that might		might impact habitats	
		that might impact	impact habitats		used by non-FMP	
		habitats used by	used by non-FMP		species	
		non-FMP species	species would not			
			change			

Table 2.13a. Comparison of Spiny Lobster FMP EFH Alternatives Continued								
Affe			Alternative 2. (Status	Alternative 6.	Alternative 8. EFH for			
Enviro	nment	Action – roll back)	Quo) EFH for the	(Preferred Alternative).	spiny lobster consists of a discontinuous			
		Do not describe	spiny lobster fishery consists of areas	EFH for the spiny lobster fishery in the	band of waters and			
		and identify EFH in the US	where various life	US Caribbean consists	substrates around St.			
					John from mean high			
			commonly occur	seagrass, benthic	water to a depth of			
		spiriy lobster r wir	Commonly occur	algae, mangrove, coral,				
				and live hard bottom	20 111			
				substrates from mean				
				high water to the outer				
				boundary of the EEZ				
	Marine	I	No direct impacts and	No direct impacts and	No direct impacts,			
	Mam-	but some indirect	no change in indirect	little change in indirect	but some indirect			
	mals	impacts because	impacts from the	impacts from the	impacts because			
	and	areas described	current situation.		areas described and			
	protect-	and identified as	Areas described and	described and	identified as EFH			
	ed	EFH previously	identified as EFH	identified as EFH	would be smaller			
	species	would no longer	would be the same as	would be essentially	than at present,			
		be considered	at present, so protection from	the same as at present, so protection from	potentially less			
		EFH, resulting in less protection	Federal activities and	Federal activities and	protection from			
		from Federal	activities requiring	activities requiring	Federal activities and			
		activities and	Federal permits that	Federal permits that	activities requiring			
			might impact habitats	might impact habitats	Federal permits that			
		Federal permits	used by marine	used by marine	might impact habitats			
		that might impact	mammals and	mammals and	used by marine			
		habitats used by	protected species	protected species	mammals and			
		marine mammals	would not change	would not change	protected species			
		and protected	_					
Human		species						
Environ-	Fish-	There are no	There are no direct	There are no direct	There are no direct			
ment	eries		impacts, but some	impacts, but some	impacts, but some			
			indirect impacts	indirect impacts	indirect impacts			
		impacts because under this	because under this	because under this Alternative the EFH	because under this			
		Alternative no	Alternative, the EFH described and	described and	Alternative the EFH described and			
		EFH would be	identified would be the		identified would be			
		described and	same as at present,	essentially the same as				
			so the Council could	at present, so the	and would all occur			
			consider adverse		in state waters, so			
			fishing impacts, and	adverse fishing	the information on			
		adverse fishing	use information	impacts, and use	this EFH could be			
		impacts, it could	regarding this EFH as	information regarding	used as a justification			
		not use EFH	a justification for any	this EFH as a	to make			
		information as a	actions taken	justification for any	recommendations to			
		justification for		actions taken	the USVI to minimize			
		any actions taken			fishing impacts, but			
					could not be used to			
					justify actions taken			
					by the Council in the			
					EEZ			

14010 2.134. 00			Alternatives Continued	
Affected Environment	Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the spiny lobster FMP	Quo) EFH for the spiny lobster fishery consists of areas where various life stages of spiny lobster commonly occur	Alternative 6. (Preferred Alternative). EFH for the spiny lobster fishery in the US Caribbean consists of all waters and seagrass, benthic algae, mangrove, coral, and live hard bottom substrates from mean high water to the outer boundary of the EEZ	
Human Fishing Environ comm-ment unities	impacts, but some	the same as at present, so the information on current EFH could be used as a justification	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be approximately the same as at present, so the information on this EFH could be used as a justification for any actions taken to minimize fishing impacts, possibly resulting in controversy within fishing communities	because under this Alternative the EFH described and identified would be less than at present and would all occur in state waters, so the information could only be used to make

Table 2.13a. Comparison of Spiny Lobster FMP EFH Alternatives Continued							
Affe	ected	Alternative 1. (No	Alternative 2. (Status	Alternative 6.	Alternative 8. EFH		
Enviro	nment	Action – roll back)	Quo) EFH for the	(Preferred Alternative).	for spiny lobster		
		Do not describe and	spiny lobster fishery	EFH for the spiny	consists of a		
		identify EFH in the	consists of areas	lobster fishery in the	discontinuous band		
		US Caribbean for	where various life	US Caribbean consists	of waters and		
		the spiny lobster	stages of spiny lobster	of all waters and	substrates around		
		FMP	commonly occur	seagrass, benthic	St. John from		
				algae, mangrove, coral,	mean high water to		
				and live hard bottom	a depth of 25 m		
				substrates from mean			
				high water to the outer			
				boundary of the EEZ			
	Federal	There are direct	There are direct	There are direct	There are direct		
		impacts because	impacts because	impacts because under			
		under this	under this Alternative,	this Alternative the	under this		
		Alternative no EFH	the EFH described	EFH described and	Alternative less		
		would be described	and identified would	identified would be	EFH would be		
		and identified, so	not change, and EFH	about the same as at	described and		
		EFH would not be	would remain part of	present, and EFH	identified than at		
		part of the	the consultation	would remain a part of	present, but that		
		consultation	process. In order to	the consultation	EFH would be part		
		process. In order to	implement this	process. However, in	of the consultation		
		implement this	Alternative, no FMP	order to implement this	process. In order to		
		Alternative, an FMP	Amendment would be	Alternative, an FMP	implement this		
Admin-		Amendment would	required	Amendment would be	Alternative, an		
istrative		be required		required	FMP Amendment		
	01-1-	The state and the	The state of the s	The state of the s	would be required		
	State	The states would	The states could	The states could	The states could		
		not receive	receive	receive	receive		
		recommendations	recommendations	recommendations from	recommendations		
		from the Council	from the Council	the Council based on	from the Council		
		based on EFH	based on EFH	EFH considerations	based on EFH		
		considerations	considerations under	under this amendment.	considerations		
		under this	this amendment. The	The states might or	under this amendment. The		
		amendment	states might or might not act on such	might not act on such			
			recommendations	recommendations	states might or		
			recommendations		might not act on such		
1		1			recommendations		

		nparison of Queen Cor Alternative 1. (No	Alternative 2.	Alternative 6. (Preferred	Alternative 8. EFH for
Affected Environment		Action – roll back) Do		Alternative of (Freiened Alternative). EFH for the	the queen conch
LIIVIIO	illioni	not describe and	for the queen	queen conch fishery in the US	consists of a
		identify EFH in the US	conch fishery	Caribbean consists of all	discontinuous band of
		Caribbean for the	consists of areas	waters and seagrass, benthic	waters and substrates
		queen conch FMP	where various life	algae, coral, live/hard bottom	around St. John from
					mean high water to a
			stages of the queen conch	mean high water to the outer	depth of 25 m
					depth of 25 m
	Duranta	NIs slipe at increase to best	commonly occur	boundary of the EEZ	Nie dine et inem e etc. le et
	Puerto	No direct impacts, but	No direct impacts	No direct impacts and little	No direct impacts, but
	Rico	some indirect impacts	and no change in	change in indirect impacts	some indirect impacts
		because EFH	indirect impacts from the current	from the current situation	because EFH would be smaller than at
		previously described and identified would be	situation.	because EFH would be	
				essentially the same as status	present, resulting in
		voided, resulting in	Protection from Federal activities	quo. Protection from Federal	potentially less
		potentially less		activities and activities	protection from
		protection from Federal	and activities	requiring Federal permits that	Federal activities and
		activities and activities	requiring Federal	might impact the physical	activities requiring
		requiring Federal	permits that might	environment would be the	Federal permits that
		permits that might	impact the physical	same as at present	might impact the
		impact the physical	environment would		physical environment
		environment	be the same as at		
Physical	USVI	NIs slipe at increase to best	present	No direct increases and little	Nie dine et inem e etc. le et
	USVI	No direct impacts, but	No direct impacts	No direct impacts and little	No direct impacts, but
		some indirect impacts	and no change in	change in indirect impacts	some indirect impacts
		because EFH	indirect impacts	from the current situation	because EFH would
		previously described and identified would be	from the current	because EFH would be	be smaller than at
			situation.	essentially the same as status	present, resulting in
		voided, resulting in	Protection from	quo. Protection from Federal activities and activities	potentially less protection from
		potentially less	Federal activities		Federal activities and
		protection from Federal		requiring Federal permits that	
		activities and activities	requiring Federal permits that might	might impact the physical environment would be the	activities requiring Federal permits that
		requiring Federal			
		permits that might impact the physical	environment would	same as at present	might impact the physical environment
		environment			priyaicai eriviroriirierit
		environinent	be the same as at		
			present		

Table 2.13b. Comparison of Queen Conch FMP EFH Alternatives

Affected Alternative 4 (No. 14		Alternative 2.	Alternative 6. (Preferred	Alternative 8. EFH for	
Affected Environment		Alternative 1. (No		`	
Enviro	nment	Action – roll back) Do	(Status Quo) EFH	Alternative). EFH for the	the queen conch
		not describe and	for the queen	queen conch fishery in the US	consists of a
		identify EFH in the US	conch fishery	Caribbean consists of all	discontinuous band of
		Caribbean for the	consists of areas	waters and seagrass, benthic	waters and substrates
		queen conch FMP	where various life	algae, coral, live/hard bottom	around St. John from
		1	stages of the	and sand/shell substrates from	
			queen conch	mean high water to the outer	depth of 25 m
			commonly occur	boundary of the EEZ	G0P 111 01 20 111
Biolog-	Ocean	No direct impacts, but	No direct impacts	No direct impacts and little	No direct impacts, but
1					
ical	water	some indirect impacts	and no change in	change in indirect impacts	some indirect impacts
	charac-	because EFH	indirect impacts	from the current situation	because EFH would
	teristics	previously described	from the current	because EFH would be	be smaller than at
		and identified would be	situation.	essentially the same as status	present, resulting in
		voided, resulting in	Protection from	quo. Protection from Federal	potentially less
		potentially less	Federal activities	activities and activities	protection from
		protection from Federal	and activities	requiring Federal permits that	Federal activities and
		activities and activities	requiring Federal	might impact water quality	activities requiring
		requiring Federal	permits that might	would be the same as at	Federal permits that
					·
		permits that might	impact water	present	might impact water
		impact water quality	quality would be		quality
			the same as at		
			present		

Table 2.13b. Comparison of Queen Conch FMP EFH Alternatives Continued

	1 able 2.13b. Comparison of Queen Conch FMP EFH Alternatives Continued					
Affe		Alternative 1. (No	Alternative 2. (Status		Alternative 8. EFH for	
Enviro	nment	Action – roll back)	Quo) EFH for the		the queen conch	
		Do not describe and	queen conch fishery	EFH for the queen	consists of a	
		identify EFH in the	consists of areas	conch fishery in the US	discontinuous band	
		US Caribbean for the	where various life	Caribbean consists of	of waters and	
		queen conch FMP	stages of the queen	all waters and	substrates around St.	
			conch commonly	seagrass, benthic	John from mean high	
			occur	algae, coral, live/hard	water to a depth of	
				bottom and sand/shell	25 m	
				substrates from mean		
				high water to the outer		
				boundary of the EEZ		
	Estuar-	No direct impacts,	No direct impacts	No direct impacts and	No direct impacts,	
	ine	but some indirect	and no change in	little change in indirect	but some indirect	
		impacts because	indirect impacts from	impacts from the	impacts because	
		areas described and	the current situation.	current situation. Areas	areas described and	
		identified as EFH	Areas described and	described and	identified as EFH	
		previously would no	identified as EFH	identified as EFH	would be smaller	
		longer be considered	would be the same	would essentially be	than at present,	
		EFH, resulting in less	as at present, so	the same as at present,	resulting in	
		protection from	protection from	so protection from	potentially less	
		Federal activities and	Federal activities and		protection from	
		activities requiring	activities requiring	activities requiring	Federal activities and	
		Federal permits that	Federal permits that	Federal permits that	activities requiring	
		might impact	might impact	might impact estuarine	Federal permits that	
		estuarine habitats	estuarine habitats	habitats would change	might impact	
Biolog-			would not change	very little	estuarine habitats	
ical	Marine	No direct impacts,	No direct impacts	No direct impacts and	No direct impacts,	
		but some indirect	and no change in	little change in indirect	but some indirect	
		impacts because	indirect impacts from	impacts from the	impacts because	
		areas described and	the current situation.	current situation. Areas	areas described and	
		identified as EFH	Areas described and	described and	identified as EFH	
		previously would no	identified as EFH	identified as EFH	would be smaller	
		longer be considered	would be the same	would essentially be	than at present,	
		EFH, resulting in less	as at present, so	the same as at present,	resulting in	
		protection from	protection from	so protection from	potentially less	
		Federal activities and	Federal activities and		protection from	
		activities requiring	activities requiring	activities requiring	Federal activities and	
		Federal permits that	Federal permits that	Federal permits that	activities requiring	
		might impact marine	might impact marine	might impact marine	Federal permits that	
		habitats	habitats would not	habitats would change	might impact marine	
			change	very little	habitats	

Table 2.	<u> Γable 2.13b. Comparison of Queen Conch FMP EFH Alternatives Continued</u>						
Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the queen conch FMP	Alternative 2. (Status Quo) EFH for the queen conch fishery consists of areas where various life stages of the queen conch commonly occur	Alternative 6. (Preferred Alternative). EFH for the queen conch fishery in the US Caribbean consists of all waters and seagrass, benthic algae, coral, live/hard bottom and sand/shell substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for the queen conch consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m		
Biolog- ical	Environ mental sites of special interest	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest would not change	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would essentially be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest would change very little	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact environmental sites of special interest		
Human Environ- ment	Fishery res- ources under FMPs	No direct impacts, but some indirect impacts because areas described and identified as EFH previously would no longer be considered EFH, resulting in less protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species	No direct impacts and no change in indirect impacts from the current situation. Areas described and identified as EFH would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact habitats	No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would be essentially the same as at present, so protection from Federal activities and activities requiring Federal permits that	No direct impacts, but some indirect impacts because areas described and identified as EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact habitats used by FMP species		

Table 2.13b. Comparison of Queen Conch FMP EFH Alternatives Continued					
Aff	ected	Alternative 1. (No	Alternative 2. (Status	Alternative 6. (Preferred	Alternative 8. EFH for
Envir	onment	Action – roll back) Do	Quo) EFH for the	Alternative). EFH for the	the queen conch
		not describe and	queen conch fishery	queen conch fishery in the	consists of a
		identify EFH in the US	consists of areas	US Caribbean consists of all	discontinuous band of
		Caribbean for the	where various life	waters and seagrass, benthic	waters and substrates
		queen conch FMP	stages of the queen	algae, coral, live/hard bottom	around St. John from
			conch commonly	and sand/shell substrates	mean high water to a
			occur	from mean high water to the	depth of 25 m
				outer boundary of the EEZ	
	Fishery	No direct impacts, but	No direct impacts and	No direct impacts and little	No direct impacts, but
	res-	some indirect impacts	no change in indirect	change in indirect impacts	some indirect impacts
	ources	because areas	impacts from the	from the current situation.	because areas
	not	described and	current situation.	Areas described and	described and
	under	identified as EFH	Areas described and	identified as EFH would be	identified as EFH
	Caribb-	previously would no	identified as EFH	essentially the same as at	would be smaller than
	ean	longer be considered	would be the same as	present, so protection from	at present, resulting in
	Council	EFH, resulting in less	at present, so	Federal activities and	potentially less
	FMPs	protection from	protection from	activities requiring Federal	protection from Federal
		Federal activities and	Federal activities and	permits that might impact	activities and activities
		activities requiring	activities requiring	habitats used by non-FMP	requiring Federal
		Federal permits that	Federal permits that	species would not change	permits that might
		might impact habitats	might impact habitats		impact habitats used
		used by non-FMP	used by non-FMP		by non-FMP species
		species	species would not		
Human			change		
	Marine	No direct impacts, but		No direct impacts and little	No direct impacts, but
n-ment		some indirect impacts	no change in indirect	change in indirect impacts	some indirect impacts
		because areas	impacts from the	from the current situation.	because areas
	protect-	described and	current situation.	Areas described and	described and
	ed	identified as EFH	Areas described and	identified as EFH would be	identified as EFH
	species	previously would no	identified as EFH	essentially the same as at	would be smaller than
		longer be considered		present, so protection from	at present, resulting in
		EFH, resulting in less	at present, so	Federal activities and	potentially less
		protection from	protection from	activities requiring Federal	protection from Federal
		Federal activities and	Federal activities and	permits that might impact	activities and activities
		activities requiring	activities requiring	habitats used by marine	requiring Federal
		Federal permits that	Federal permits that	mammals and protected	permits that might
		might impact habitats	might impact habitats	species would not change	impact habitats used
		used by marine	used by marine		by marine mammals
		mammals and	mammals and		and protected species
		protected species	protected species		
			would not change		

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		mparison of Queen C			
Affected		Alternative 1. (No	Alternative 2. (Status		Alternative 8. EFH for
Environment		Action – roll back)	Quo) EFH for the	(Preferred Alternative).	the queen conch
		Do not describe and	queen conch fishery	EFH for the queen	consists of a
		identify EFH in the	consists of areas	conch fishery in the US	discontinuous band
		US Caribbean for the		Caribbean consists of	of waters and
		queen conch FMP	stages of the queen	all waters and	substrates around St.
			conch commonly	seagrass, benthic	John from mean high
			occur	algae, coral, live/hard	water to a depth of
				bottom and sand/shell	25 m
				substrates from mean	
				high water to the outer	
				boundary of the EEZ	
	Federal	There are direct	There are direct	There are direct	There are direct
		impacts because	impacts because	impacts because under	
		under this Alternative	under this	this Alternative the	under this Alternative
		no EFH would be	Alternative, the EFH	EFH described and	less EFH would be
		described and	described and	identified would be	described and
		identified, so EFH	identified would not	about the same as at	identified than at
		would not be part of	change, and EFH	present, and EFH	present, but that EFH
		the consultation	would remain part of	would remain a part of	would be part of the
		process. In order to	the consultation	the consultation	consultation process.
		implement this	process. In order to	process. However, in	In order to implement
		Alternative, an FMP	implement this	order to implement this	this Alternative, an
		Amendment would	Alternative, no FMP	Alternative, an FMP	FMP Amendment
		be required	Amendment would	Amendment would be	would be required
			be required	required	
Admin-	State	The states would not		The states could	The states could
istrative		receive	receive	receive	receive
		recommendations	recommendations	recommendations from	
		from the Council	from the Council	the Council based on	from the Council
		based on EFH	based on EFH	EFH considerations	based on EFH
		considerations under	considerations under		considerations under
		this amendment	this amendment. The	The states might or	this amendment. The
			states might or might	might not act on such	states might or might
			not act on such	recommendations	not act on such
			recommendations		recommendations

Table 2.13c. Comparison of Reef Fish FMP EFH Alternatives

Table 2.	Table 2.13c. Comparison of Reef Fish FMP EFH Alternatives							
Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the reef fish FMP	Alternative 2. (Status Quo) EFH for the reef fish fishery consists of areas where various life stages of reef fish commonly occur	Alternative 6. (Preferred Alternative). EFH for the reef fish fishery in the US Caribbean consists of all waters and substrates from mean high water to the outer boundary of the EEZ				
Physical	Puerto Rico	activities and activities requiring Federal permits that might impact the physical environment	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment			
riysical	USVI	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts, but some indirect impacts because EFH would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment			
Biolog- ical	Ocean water charac- teristics	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact water quality	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact water quality would be the same as at present		be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact water			

Table 2.13c. Comparison of Reef Fish FMP EFH Alternatives Continued

1 ab	Table 2.13c. Comparison of Reef Fish FMP EFH Alternatives Continued						
Aff	ected	Alternative 1. (No	Alternative 2. (Status	Alternative 6. (Preferred	Alternative 8. EFH for		
Envir	onment	Action – roll back) Do	Quo) EFH for the reef	Alternative). EFH for the	reef fish consists of a		
		not describe and	fish fishery consists of	reef fish fishery in the US	discontinuous band of		
		identify EFH in the US	areas where various life	Caribbean consists of all	waters and substrates		
		Caribbean for the reef	stages of reef fish	waters and substrates	around St. John from		
		fish FMP	commonly occur	from mean high water to	mean high water to a		
			John Marine Cook	the outer boundary of the	depth of 25 m		
				EEZ	dopur or 20 m		
	Estuar-	No direct impacts, but	No direct impacts and	No direct impacts and little	No direct impacts, but		
	ine	some indirect impacts	no change in indirect	change in indirect impacts	some indirect impacts		
		because areas	impacts from the current	from the current situation.	because areas described		
		described and	situation. Areas	Areas described and	and identified as EFH		
		identified as EFH	described and identified	identified as EFH would	would be smaller than at		
		previously would no	as EFH would be the	essentially be the same as	present, resulting in		
		longer be considered	same as at present, so	at present, so protection	potentially less protection		
		EFH, resulting in less	protection from Federal	from Federal activities and			
		protection from Federal	activities and activities		and activities requiring		
		activities and activities	requiring Federal	permits that might impact	Federal permits that		
		requiring Federal	permits that might	estuarine habitats would	might impact estuarine		
		permits that might	impact estuarine	change very little	habitats		
		impact estuarine	habitats would not	gu,			
		habitats	change				
	Marine	No direct impacts, but	No direct impacts and	No direct impacts and little	No direct impacts, but		
		some indirect impacts	no change in indirect	change in indirect impacts	some indirect impacts		
		because areas		from the current situation.	because areas described		
		described and	situation. Areas	Areas described and	and identified as EFH		
		identified as EFH	described and identified	identified as EFH would	would be smaller than at		
		previously would no	as EFH would be the	essentially be the same as			
Biolog		longer be considered	same as at present, so	at present, so protection	potentially less protection		
-ical		EFH, resulting in less	protection from Federal	from Federal activities and			
		protection from Federal	activities and activities	activities requiring Federal	and activities requiring		
		activities and activities	requiring Federal	permits that might impact	Federal permits that		
		requiring Federal	permits that might	marine habitats would	might impact marine		
		permits that might	impact marine habitats	change very little	habitats		
		impact marine habitats	would not change	onange very intic	nabitats		
	Environ	No direct impacts, but	No direct impacts and	No direct impacts and little	No direct impacts, but		
	mental	some indirect impacts	no change in indirect	change in indirect impacts	some indirect impacts		
	sites of	because areas	_	from the current situation.	because areas described		
	special	described and	situation. Areas	Areas described and	and identified as EFH		
		identified as EFH	described and identified	identified as EFH would	would be smaller than at		
		previously would no	as EFH would be the	essentially be the same as	present, resulting in		
		longer be considered	same as at present, so	at present, so protection	potentially less protection		
		EFH, resulting in less	protection from Federal	from Federal activities and			
		protection from Federal	activities and activities	activities requiring Federal	and activities requiring		
		activities and activities	requiring Federal	permits that might impact	Federal permits that		
		requiring Federal	permits that might	environmental sites of	might impact		
		permits that might	impact environmental	special interest would	environmental sites of		
		impact environmental	sites of special interest	change very little	special interest		
		sites of special interest	would not change		•		

Table 2.13c. Comparison of Reef Fish FMP EFH Alternatives Continued

	Table 2.13c. Comparison of Reef Fish FMP EFH Alternatives Continued						
Affec	cted		Alternative 2. (Status Quo)		Alternative 8. EFH for		
Enviror	nment	roll back) Do not	EFH for the reef fish	Alternative). EFH for the	reef fish consists of a		
		describe and identify	fishery consists of areas	reef fish fishery in the US	discontinuous band of		
		EFH in the US Caribbean	where various life stages	Caribbean consists of all	waters and substrates		
		for the reef fish FMP	of reef fish commonly	waters and substrates from	around St. John from		
			occur	mean high water to the	mean high water to a		
				outer boundary of the EEZ	depth of 25 m		
	Fisherv	No direct impacts, but	No direct impacts and no	No direct impacts and little	No direct impacts, but		
	res-	some indirect impacts	change in indirect impacts	change in indirect impacts	some indirect impacts		
			from the current situation.	from the current situation.	because areas described		
		and identified as EFH	Areas described and	Areas described and	and identified as EFH		
		previously would no	identified as EFH would		would be smaller than at		
	i ivii 3	longer be considered			present, resulting in		
		EFH, resulting in less			potentially less protection		
		protection from Federal	activities and activities	Federal activities and	from Federal activities		
		activities and activities	requiring Federal permits	activities requiring Federal	and activities requiring		
		requiring Federal permits	that might impact habitats	permits that might impact	Federal permits that		
		that might impact habitats	used by FMP species	habitats used by FMP	might impact habitats		
	- : .	used by FMP species	would not change	species would not change	used by FMP species		
	-	No direct impacts, but	No direct impacts and no	No direct impacts and little	No direct impacts, but		
	res-	some indirect impacts	change in indirect impacts	change in indirect impacts	some indirect impacts		
		because areas described	from the current situation.	from the current situation.	because areas described		
	not	and identified as EFH	Areas described and	Areas described and	and identified as EFH		
		previously would no	identified as EFH would		would be smaller than at		
		longer be considered	be the same as at present,		present, resulting in		
	ean	EFH, resulting in less			potentially less protection		
		protection from Federal	activities and activities	Federal activities and	from Federal activities		
ment	I FMPs	activities and activities	requiring Federal permits	activities requiring Federal	and activities requiring		
		requiring Federal permits	that might impact habitats	permits that might impact	Federal permits that		
		that might impact habitats	used by non-FMP species	habitats used by non-FMP	might impact habitats		
		used by non-FMP	would not change	species would not change	used by non-FMP		
		species	_		species		
	Marine	No direct impacts, but	No direct impacts and no	No direct impacts and little	No direct impacts, but		
		some indirect impacts	change in indirect impacts	change in indirect impacts	some indirect impacts		
			from the current situation.	from the current situation.	because areas described		
		and identified as EFH	Areas described and	Areas described and	and identified as EFH		
	-ed	previously would no	identified as EFH would		would be smaller than at		
		longer be considered	be the same as at present,		present, resulting in		
	S	0		,	potentially less protection		
	-	protection from Federal	activities and activities		from Federal activities		
		activities and activities	requiring Federal permits	activities requiring Federal	and activities requiring		
			that might impact habitats	permits that might impact	Federal permits that		
				habitats used by marine	might impact habitats		
		used by marine	and protected species	mammals and protected	used by marine		
		mammals and protected	would not change	species would not change	mammals and protected		
		species	Thousand Hot Gridingo	Total Total Grange	species		
		100000	I	I	100000		

Table 2.13c. Comparison of Reef Fish FMP EFH Alternatives Continued

Tai	Table 2.13c. Comparison of Reef Fish FMP EFH Alternatives Continued					
Affected Environment			identify EFH in the	Alternative 2. (Status Quo) EFH for the reef fish fishery consists of areas where various life stages of reef fish commonly occur	Alternative 6. (Preferred Alternative). EFH for the reef fish fishery in the US Caribbean consists of all waters and substrates from mean high water to the outer boundary of the EEZ	Alternative 8. EFH for reef fish consists of a discontinuous band of waters and substrates around St. John from mean high water to a depth of 25 m
	man viron-	Fish- eries	There are no direct impacts, but some indirect impacts because under this Alternative no EFH would be described and identified, so while the Council could still consider adverse fishing impacts, it could not use EFH information as a justification for any actions taken	There are no direct impacts, but some indirect impacts because under this Alternative, the EFH described and identified would be the same as at present, so the Council could consider adverse fishing impacts, and use information regarding this EFH as a justification for any actions taken	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be essentially the same as at present, so the Council could consider adverse fishing impacts, and use information regarding this EFH as a justification for any actions taken	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be less than at present and would all occur in state waters, so the information on this EFH could be used as a justification to make recommendations to the USVI to minimize fishing impacts, but could not be used to justify actions taken by the Council in the EEZ
		Fishing communities	There are no direct impacts, but some indirect impacts as no EFH is described and identified, and therefore cannot be used to justify actions taken to minimize adverse fishing impacts, there may be less controversy within fishing communities	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be the same as at present, so the information on current EFH could be used as a justification for any actions taken to minimize fishing impacts, possibly resulting in controversy within fishing communities	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be approximately the same as at present, so the information on this EFH could be used as a justification for any actions taken to minimize fishing impacts, possibly resulting in controversy within fishing communities	There are no direct impacts, but some indirect impacts because under this Alternative the EFH described and identified would be less than at present and would all occur in state waters, so the information could only be used to make recommendations to the USVI to minimize fishing impacts, possibly resulting in less controversy

Table 2.13c. Comparison of Reef Fish FMP EFH Alternatives Continued

	Table 2.13c. Comparison of Reci 11sh I Wi El II Alternatives Continued						
Affected		Alternative 1. (No	Alternative 2. (Status	Alternative 6. (Preferred	Alternative 8. EFH for		
Environment		Action – roll back)	Quo) EFH for the reef	,	reef fish consists of a		
		Do not describe and	fish fishery consists of	reef fish fishery in the	discontinuous band of		
		identify EFH in the	areas where various	US Caribbean consists	waters and substrates		
			life stages of reef fish	of all waters and	around St. John from		
		reef fish FMP	commonly occur	substrates from mean	mean high water to a		
				high water to the outer	depth of 25 m		
				boundary of the EEZ			
	Federal	There are direct	There are direct	There are direct impacts	There are direct		
		impacts because	impacts because under	because under this	impacts because under		
		under this Alternative	this Alternative, the	Alternative the EFH	this Alternative less		
		no EFH would be	EFH described and	described and identified	EFH would be		
		described and	identified would not	would be about the	described and		
		identified, so EFH	change, and EFH	same as at present, and	identified than at		
		would not be part of	would remain part of	EFH would remain a	present, but that EFH		
		the consultation	the consultation	part of the consultation	would be part of the		
		process. In order to	process. In order to	process. However, in	consultation process.		
		implement this	implement this	order to implement this	In order to implement		
Admin-		Alternative, an FMP	Alternative, no FMP	Alternative, an FMP	this Alternative, an		
istrative		Amendment would	Amendment would be	Amendment would be	FMP Amendment		
		be required	required	required	would be required		
	State	The states would not	The states could	The states could receive	The states could		
		receive	receive	recommendations from	receive		
		recommendations	recommendations from	the Council based on	recommendations from		
		from the Council	the Council based on	EFH considerations	the Council based on		
		based on EFH	EFH considerations	under this amendment.	EFH considerations		
		considerations under	under this amendment.	The states might or	under this amendment.		
		this amendment	The states might or	might not act on such	The states might or		
			might not act on such	recommendations	might not act on such		
			recommendations		recommendations		

Table 2.13d. Comparison of Coral FMP EFH Alternatives

	Table 2.	.13d. Co	omparison of Coral FMP	EFH Alternatives	
	Affected Environment		Alternative 1. (No Action – roll back) Do not describe and identify EFH in the US Caribbean for the coral FMP	EFH for the coral fishery	Alternative 6. (Preferred Alternative). EFH for the coral fishery in the US Caribbean consists of all waters and coral and hard bottom substrates from mean low water to the outer boundary of the EEZ
Physica	Physical	Rico	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present
	riiysicai	USVI	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present
=	Biolog-	water charact eristics	No direct impacts, but some indirect impacts because EFH previously described and identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact water quality	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact water quality would be the same as at present	No direct impacts and little change in indirect impacts from the current situation because EFH would be essentially the same as status quo. Protection from Federal activities and activities requiring Federal permits that might impact water quality would be the same as at present
	ical	Estuar- ine	be considered EFH,		No direct impacts and little change in indirect impacts from the current situation. Areas described and identified as EFH would essentially be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats would change very little

Table 2.13d. Comparison of Coral FMP EFH Alternatives Continued

Table 2.13d. Comparison of Coral FMP EFH Alternatives Continued

		Alternative 1. (No Action –	Alternative 2 (Status Oug)	Alternative 6. (Preferred
_	nment	roll back) Do not describe		Alternative of (Freiened Alternative). EFH for the coral
LIIVIIC	niiii c iit	and identify EFH in the US		fishery in the US Caribbean
		Caribbean for the coral	various life stages of coral	consists of all waters and coral
		FMP	commonly occur	and hard bottom substrates from
				mean low water to the outer
				boundary of the EEZ
	Fishery	No direct impacts, but	No direct impacts and no	No direct impacts and little change
	res-	some indirect impacts	change in indirect impacts	in indirect impacts from the current
	ources		from the current situation.	situation. Areas described and
	not	and identified as EFH	Areas described and	identified as EFH would be
	under		identified as EFH would be	essentially the same as at present,
	Caribb-	be considered EFH,	the same as at present, so	so protection from Federal
	ean	resulting in less protection	protection from Federal	activities and activities requiring
	Council	from Federal activities and	activities and activities	Federal permits that might impact
	FMPs	activities requiring Federal	requiring Federal permits	habitats used by non-FMP species
		permits that might impact	that might impact habitats	would not change
		habitats used by non-FMP	used by non-FMP species	_
		species	would not change	
	Marine	No direct impacts, but	No direct impacts and no	No direct impacts and little change
	Mam-	some indirect impacts	change in indirect impacts	in indirect impacts from the current
	mals		from the current situation.	situation. Areas described and
	and	and identified as EFH	Areas described and	identified as EFH would be
			identified as EFH would be	essentially the same as at present,
Human	•	be considered EFH,	the same as at present, so	so protection from Federal
Environ		resulting in less protection	protection from Federal	activities and activities requiring
-ment			activities and activities	Federal permits that might impact
		activities requiring Federal		habitats used by marine mammals
		permits that might impact	that might impact habitats	and protected species would not
		habitats used by marine	used by marine mammals	change
		mammals and protected	and protected species	onange
		species	would not change	
	Fish-	There are no direct	There are no direct	There are no direct impacts, but
	eries			some indirect impacts because
	0.100	impacts because under	impacts because under this	under this Alternative the EFH
		this Alternative no EFH	Alternative, the EFH	described and identified would be
		would be described and	described and identified	essentially the same as at present,
		identified, so while the	would be the same as at	so the Council could consider
		Council could still consider		adverse fishing impacts, and use
		adverse fishing impacts, it		information regarding this EFH as
		could not use EFH	fishing impacts, and use	a justification for any actions taken
			information regarding this	a justification for any dollors taken
		taken	any actions taken	
		lancii	any actions taken	

Table 2.13d. Comparison of Coral FMP EFH Alternatives Continued

Table 2.13d. Comparison of Cofar Pivir ETTI Afternatives Continued					
	cted		Alternative 2. (Status Quo)	Alternative 6. (Preferred	
Enviro	nment	roll back) Do not describe		Alternative). EFH for the coral	
		and identify EFH in the US		fishery in the US Caribbean	
		Caribbean for the coral	various life stages of coral	consists of all waters and coral	
		FMP	commonly occur	and hard bottom substrates from	
				mean low water to the outer	
				boundary of the EEZ	
Human	Fishing	There are no direct	There are no direct	There are no direct impacts, but	
Environ	comm-	impacts, but some indirect	impacts, but some indirect	some indirect impacts because	
-ment	unities	impacts as no EFH is	impacts because under this	under this Alternative the EFH	
		described and identified,	Alternative the EFH	described and identified would be	
		and therefore cannot be	described and identified	approximately the same as at	
		used to justify actions	would be the same as at	present, so the information on this	
		taken to minimize adverse	present, so the information	EFH could be used as a	
		fishing impacts, there may	on current EFH could be	justification for any actions taken	
		be less controversy within	used as a justification for	to minimize fishing impacts,	
		fishing communities	any actions taken to	possibly resulting in controversy	
			minimize fishing impacts,	within fishing communities	
			possibly resulting in		
			controversy within fishing		
			communities		
Admin-	Federal	There are direct impacts	There are direct impacts	There are direct impacts because	
istrative	i caciai	because under this	because under this	under this Alternative the EFH	
lotiativo		Alternative no EFH would	Alternative, the EFH	described and identified would be	
		be described and	described and identified	about the same as at present, and	
		identified, so EFH would	would not change, and	EFH would remain a part of the	
		not be part of the	EFH would remain part of	consultation process. However, in	
		consultation process. In	the consultation process. In	order to implement this	
		order to implement this	order to implement this	Alternative, an FMP Amendment	
		Alternative, an FMP	Alternative, no FMP	would be required	
		Amendment would be	Amendment would be	Would be required	
		required	required		
	·		The states could receive	The states could receive	
		The states would not			
		receive recommendations	recommendations from the	recommendations from the	
		from the Council based on		Council based on EFH	
		EFH considerations under	considerations under this	considerations under this	
		this amendment	amendment. The states	amendment. The states might or	
			might or might not act on	might not act on such	
			such recommendations	recommendations	

Table 2.14 Comparison of US Caribbean HAPC Alternatives

Affec	cted	Alternative 1 (No	Alternative 2	Alternative 4	Alternative 7.	Alternative 8.
Environment		Action-Roll Back) Do not identify any HAPCs	(Status Quo) Designate HAPC as nearshore reefs, nearshore hardbottom, and estuaries.	spawning	Designate as HAPCs natural reserves aligned most closely with the Reef Fish species	(Preferred) Designate as HAPCs, natural reserves aligned most closely with Coral species
Physical	Puerto Rico	permits that might impact the physical environment	change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact the physical environment would be the same as at present	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities and activities requiring Federal permits that might impact the physical environment	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Coral FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment
	USVI	and activities	from the current situation. Protection from Federal activities and activities requiring	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact the physical environment	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Coral FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities and activities requiring Federal permits that might impact the physical environment

Table 2.14 Comparison of US Caribbean HAPC Alternatives Continued

Table 2.14 Comparison of US Caribbean HAPC						
Affected Environment		Alternative 1 (No Action-Roll Back) Do not identify any HAPCs	Alternative 2 (Status Quo) Designate HAPC as nearshore reefs, nearshore hardbottom, and estuaries.	spawning	Alternative 7. Designate as HAPCs natural reserves aligned most closely with the Reef Fish species	Alternative 8. (Preferred) Designate as HAPCs, natural reserves aligned most closely with Coral species
Physical	water charac-	some indirect impacts because HAPCs previously identified would be voided, resulting in potentially less protection from Federal activities and activities requiring Federal permits	No direct impacts and no change in indirect impacts from the current situation. Protection from Federal activities and activities requiring Federal permits that might impact water quality would be	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact water quality	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact water quality	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, Coral FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact water quality
Biolog- ical	Estuar- ine	No direct impacts, but some indirect impacts because areas identified as HAPCs previously would no longer be considered HAPCs, resulting in less protection from Federal activities and activities requiring Federal permits	change in indirect impacts from the current situation. Areas identified as HAPCs would be the same as at present, so protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats would	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities and activities requiring Federal permits that might impact estuarine habitats	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Reef Fish FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities and activities requiring Federal permits that might impact estuarine habitats	No direct impacts, but some indirect impacts because if this Alternative were chosen by itself, areas identified as Coral FMP HAPCs would be smaller than at present, resulting in potentially less protection from Federal activities and activities requiring Federal permits that might impact estuarine habitats

Table 2.14 Comparison of US Caribbean HAPC Alternatives Continued

Table 2.14 Comparison of US Caribbean HAPC						
Affe		Alternative 1	Alternative 2	Alternative 4	Alternative 7.	Alternative 8.
Enviro	nment	(No Action-Roll	(Status Quo)	Designate HAPCs	Designate as	(Preferred)
		Back) Do not	Designate	in the Reef Fish	HAPCs natural	Designate as
		identify any	HAPC as	FMP based on the	reserves aligned	HAPCs, natural
		HAPCs	nearshore reefs,	occurrence of	most closely with	reserves aligned
			nearshore	spawning	the Reef Fish	most closely with
			hardbottom, and	locations.	species	Coral species
			estuaries.			
	Marine	No direct	No direct	No direct impacts,	No direct impacts,	No direct impacts,
		impacts, but	impacts and no	but some indirect	but some indirect	but some indirect
		some indirect	change in	impacts because	impacts because	impacts because
		impacts	indirect impacts	if this Alternative	if this Alternative	if this Alternative
		because areas	from the current	were chosen by	were chosen by	were chosen by
		identified as		itself, areas	itself, areas	itself, areas
		HAPCs	identified as	identified as Reef	identified as Reef	identified as Coral
		previously	HAPCs would	Fish FMP HAPCs	Fish FMP HAPCs	FMP HAPCs
		would no longer	be the same as	would be smaller	would be smaller	would be smaller
		be considered	at present, so	than at present,	than at present,	than at present,
		HAPCs,	protection from	resulting in	resulting in	resulting in
		resulting in less	Federal	potentially less	potentially less	potentially less
		protection from	activities and	protection from	protection from	protection from
		Federal	activities	Federal activities	Federal activities	Federal activities
		activities and	requiring	and activities	and activities	and activities
		activities		requiring Federal	requiring Federal	requiring Federal
		requiring	that might	permits that might	permits that might	permits that might
			impact marine	impact marine	impact marine	impact marine
		that might	habitats would	habitats	habitats	habitats
		impact marine	not change			
		habitats				
Biologic	Environ	No direct	No direct	No direct impacts,	No direct impacts,	No direct impacts,
al	mental	impacts, but	impacts and no	but some indirect	but some indirect	but some indirect
	sites of	some indirect	change in	impacts because	impacts because	impacts because
	special	impacts		if this Alternative	if this Alternative	if this Alternative
	interest	because areas	from the current	were chosen by	were chosen by	were chosen by
		identified as	situation. Areas	itself, areas	itself, areas	itself, areas
		HAPCs	identified as	identified as Reef	identified as Reef	identified as Coral
		previously	HAPCs would	Fish FMP HAPCs	Fish FMP HAPCs	FMP HAPCs
		would no longer	be the same as	would be smaller	would be smaller	would be smaller
		be considered		than at present,	than at present,	than at present,
		HAPCs,	protection from	resulting in	resulting in	resulting in
		resulting in less	Federal	potentially less	potentially less	potentially less
		protection from	activities and	protection from	protection from	protection from
		Federal	activities	Federal activities	Federal activities	Federal activities
		activities and	requiring	and activities	and activities	and activities
		activities	Federal permits	requiring Federal	requiring Federal	requiring Federal
		requiring	that might	permits that might	permits that might	permits that might
		Federal permits	impact	impact	impact	impact
		that might	environmental	environmental	environmental	environmental
		impact	sites of special	sites of special	sites of special	sites of special
		environmental	interest would	interest	interest	interest
		sites of special	not change			
		interest				

Table 2.14 Comparison of US Caribbean HAPC Alternatives Continued

Table 2.14 Comparison of US Caribbean HAPC						
Affe	cted	Alternative 1	Alternative 2	Alternative 4	Alternative 7.	Alternative 8.
Enviro	nment	(No Action-Roll	(Status Quo)	Designate HAPCs	Designate as	(Preferred)
		Back) Do not	Designate	in the Reef Fish	HAPCs natural	Designate as
		identify any	HAPC as	FMP based on the	reserves aligned	HAPCs, natural
		HAPCs	nearshore reefs,	occurrence of	most closely with	reserves aligned
			nearshore	spawning	the Reef Fish	most closely with
			hardbottom, and		species	Coral species
			estuaries.		GP 60.00	Co.a. opco.co
	Fishery	No direct	No direct	No direct impacts,	No direct impacts,	No direct impacts,
	res-	impacts, but		but some indirect	but some indirect	but some indirect
	ources	some indirect	change in	impacts because	impacts because	impacts because
	under		-	if this Alternative	if this Alternative	if this Alternative
	FMPs	impacts	from the current			
	LINIL2	because areas			were chosen by	were chosen by
		identified as		itself, areas	itself, areas	itself, areas
		HAPCs	identified as	identified as Reef	identified as Reef	identified as Coral
		previously	HAPCs would	Fish FMP HAPCs	Fish FMP HAPCs	FMP HAPCs
		would no longer	be the same as	would be smaller	would be smaller	would be smaller
		be considered	at present, so	than at present,	than at present,	than at present,
		HAPCs,	protection from	resulting in	resulting in	resulting in
		resulting in less	Federal	potentially less	potentially less	potentially less
		protection from	activities and	protection from	protection from	protection from
		Federal	activities	Federal activities	Federal activities	Federal activities
		activities and	requiring	and activities	and activities	and activities
		activities	Federal permits	requiring Federal	requiring Federal	requiring Federal
		requiring	that might	permits that might	permits that might	permits that might
		Federal permits	impact habitats	impact habitats	impact habitats	impact habitats
		that might	used by FMP	used by FMP	used by FMP	used by FMP
		impact habitats	species would	species	species	species
l		used by FMP	not change	'	'	'
Human		species	3			
Environ-	Fishery	No direct	No direct	No direct impacts,	No direct impacts,	No direct impacts,
ment	res-	impacts, but		but some indirect	but some indirect	but some indirect
	ources	some indirect	change in	impacts because	impacts because	impacts because
	not	impacts		if this Alternative	if this Alternative	if this Alternative
	under	because areas	from the current		were chosen by	were chosen by
	Caribb-	identified as		itself, areas	itself, areas	itself, areas
		HAPCs	identified as	identified as Reef	identified as Reef	identified as Coral
	ean Council	previously	HAPCs would	Fish FMP HAPCs		FMP HAPCs
	FMPs	ļ			would be smaller	would be smaller
	I IVIF 5	would no longer be considered		would be smaller		
			at present, so	than at present,	than at present,	than at present,
		HAPCs,	protection from	resulting in	resulting in	resulting in
		resulting in less	Federal	potentially less	potentially less	potentially less
		protection from	activities and	protection from	protection from	protection from
		Federal	activities	Federal activities	Federal activities	Federal activities
		activities and	requiring	and activities	and activities	and activities
		activities	Federal permits	requiring Federal	requiring Federal	requiring Federal
		requiring	that might		permits that might	permits that might
		Federal permits		impact habitats	impact habitats	impact habitats
		that might	used by non-	used by non-FMP	used by non-FMP	used by non-FMP
		impact habitats	FMP species	species	species	species
		used by non-	would not			
1		FMP species	change			

Table 2.14 Comparison of US Caribbean HAPC Alternatives Continued

	Table 2.14 Comparison of US Caribbean HAPC.					T
Affe	cted	Alternative 1	Alternative 2	Alternative 4	Alternative 7.	Alternative 8.
Enviro	nment	(No Action-Roll	(Status Quo)	Designate HAPCs	Designate as	(Preferred)
		Back) Do not	Designate	in the Reef Fish	HAPCs natural	Designate as
		identify any	HAPC as	FMP based on the	reserves aligned	HAPCs, natural
		HAPCs	nearshore reefs,	occurrence of	most closely with	reserves aligned
			nearshore	spawning	the Reef Fish	most closely with
			hardbottom, and	locations.	species	Coral species
	_		estuaries.		-	•
Human	Marine	No direct	No direct	No direct impacts,	No direct impacts,	No direct impacts,
Environ-	Mam-	impacts, but	impacts and no	but some indirect	but some indirect	but some indirect
ment	mals	some indirect	change in	impacts because	impacts because	impacts because
	and	impacts	indirect impacts	if this Alternative	if this Alternative	if this Alternative
	protect-	because areas	from the current	were chosen by	were chosen by	were chosen by
	ed	identified as	situation. Areas	itself, areas	itself, areas	itself, areas
	species	HAPCs	identified as	identified as Reef	identified as Reef	identified as Coral
		previously	HAPCs would	Fish FMP HAPCs	Fish FMP HAPCs	FMP HAPCs
		would no longer	be the same as	would be smaller	would be smaller	would be smaller
		be considered	at present, so	than at present,	than at present,	than at present,
		HAPCs,	protection from	resulting in	resulting in	resulting in
		resulting in less	Federal	potentially less	potentially less	potentially less
		protection from	activities and	protection from	protection from	protection from
		Federal	activities	Federal activities	Federal activities	Federal activities
		activities and	requiring	and activities	and activities	and activities
		activities	Federal permits	requiring Federal	requiring Federal	requiring Federal
		requiring	that might	permits that might	permits that might	permits that might
		Federal permits	impact habitats	impact habitats	impact habitats	impact habitats
		that might	used by marine	used by marine	used by marine	used by marine
		impact habitats	mammals and	mammals and	mammals and	mammals and
		used by marine	protected	protected species	protected species	protected species
		mammals and	species would		-	-
		protected	not change			
		species	_			

Table 2.14 Comparison of US Caribbean HAPC Alternatives Continued

	Affected Alternative 1 Alternative 2					Altamatica O
			Alternative 2	Alternative 4	Alternative 7.	Alternative 8.
Enviro	nment	(No Action-Roll	(Status Quo)	•	Designate as	(Preferred)
			Designate	in the Reef Fish	HAPCs natural	Designate as
		identify any	HAPC as	FMP based on the	_	HAPCs, natural
		HAPCs	nearshore reefs,		most closely with	reserves aligned
			nearshore	spawning	the Reef Fish	most closely with
			hardbottom, and	locations.	species	Coral species
			estuaries.			
Human	Fish-	There are no	There are no	There are no	There are no	There are no
Environ-	eries	direct impacts,	direct impacts,	direct impacts, but	direct impacts, but	direct impacts, but
ment		but some	but some	some indirect	some indirect	some indirect
		indirect impacts	indirect impacts	impacts because	impacts because	impacts because
		because under	because under	under this	under this	under this
		this Alternative	this Alternative,	Alternative the	Alternative the	Alternative the
		no HAPCs	the HAPCs	Reef Fish FMP	Reef Fish FMP	Coral FMP
		would be	identified would	HAPCs identified	HAPCs identified	HAPCs identified
		identified, so	be the same as	would be less	would be less	would be less
		while the	at present, so	than at present.	than at present	than at present
		Council could	the Council	Some HAPCs	and would all	and would all
		still consider	could consider	would occur in	occur in state	occur in state
		adverse fishing	adverse fishing	state waters, so	waters, so the	waters, so the
		impacts, it could	impacts, and	the information on	information on	information on
		not use HAPC	use information	these Reef Fish	these Reef Fish	these Coral FMP
		information as a	regarding these	FMP HAPCs	FMP HAPCs	HAPCs could be
		justification for	HAPCs as a	could only be	could be used as	used as a
		any actions	justification for	used as a	a justification to	justification to
		taken	any actions	justification to	make	make
			taken	, make	recommendations	recommendations
				recommendations	to the states to	to the states to
				to the states to	minimize fishing	minimize fishing
				minimize fishing	impacts, but could	impacts, but could
				impacts. Other	not be used to	not be used to
				HAPCs occur in	justify actions	justify actions
				the EEZ and	taken by the	taken by the
				information on	Council in the	Council in the
				these could be	EEZ	EEZ
				used to justify	· -	
				actions taken by		
				the Council in the		
				EEZ		
			l			

Table 2.14 Comparison of US Caribbean HAPC Alternatives Continued

				Alternatives Cont		T
Affe		Alternative 1		Alternative 4	Alternative 7.	Alternative 8.
Enviro	nment	(No Action-Roll	(Status Quo)		Designate as	(Preferred)
		Back) Do not	Designate	in the Reef Fish	HAPCs natural	Designate as
		identify any	HAPC as	FMP based on the	reserves aligned	HAPCs, natural
		HAPCs	nearshore reefs.	occurrence of	most closely with	reserves aligned
			nearshore	spawning	the Reef Fish	most closely with
			hardbottom, and		species	Coral species
			estuaries.			
Human	Fishing	There are no	There are no	There are no	There are no	There are no
Environ	comm-	direct impacts,				direct impacts, but
ment	unities	but some	but some	some indirect	some indirect	some indirect
IIIGII	unines	indirect impacts		impacts because	impacts because	impacts because
		as no HAPCs	because under	under this	under this	under this
		would be	this Alternative	Alternative the	Alternative the	Alternative the
		identified, and	the HAPCs	Reef Fish FMP	Reef Fish FMP	Coral FMP
		therefore could	identified would	HAPCs identified	HAPCs identified	HAPCs identified
		not be used to		would be less	would be less	would be less
		justify actions	at present, so	than at present,	than at present	than at present
		taken to		with some	and would all	and would all
		minimize	on current	3	occur in state	occur in state
		adverse fishing			waters, so the	waters, so the
		impacts, so		in the EEZ.	information could	information could
		there may be	justification for	Information on	only be used to	only be used to
		less controversy	any actions		make	make
		within fishing	taken to	waters could only	recommendations	recommendations
		communities	minimize fishing	be used to make	to the states to	to the states to
			impacts,	recommendations	minimize fishing	minimize fishing
			possibly	to the states to	impacts, possibly	impacts, possibly
			resulting in	minimize fishing	resulting in less	resulting in less
			controversy	impacts.	controversy	controversy
			within fishing	Controversy may		
			communities	be intermediate		
Admin-	Federal	There are direct	There are direct	There are direct	There are direct	There are direct
istrative		impacts	impacts	impacts because	impacts because	impacts because
		because under		under this	under this	under this
		this Alternative		Alternative less	Alternative less	Alternative less
		no HAPCs	the HAPCs	Reef Fish FMP	Reef Fish FMP	Coral FMP
		would be		HAPCs would be	HAPCs would be	HAPCs would be
		identified, so			identified than at	identified than at
		HAPCs would	HAPCs would		present, but those	present, but those
		not be part of	remain part of	HAPCs would be	HAPCs would be	HAPCs would be
		the consultation		part of the	part of the	part of the
		process. In	process. In	consultation	consultation	consultation
		order to	order to	process. In order	process. In order	process. In order
		implement this	implement this	1	to implement this	to implement this
		Alternative, an	Alternative, no	Alternative, an	Alternative, an	Alternative, an
		FMP	FMP		FMP Amendment	FMP Amendment
		Amendment	Amendment		would be required	would be required
		would be	would be	Would be required	Would be required	Would be required
		required	required			
		required	required			

Table 2.14 Comparison of US Caribbean HAPC Alternatives Continued

Affected Environment		Alternative 1 (No Action-Roll Back) Do not identify any HAPCs	HAPC as nearshore reefs,	spawning	HAPCs natural	Alternative 8. (Preferred) Designate as HAPCs, natural reserves aligned most closely with Coral species
Administ rative	State	The states would not receive recommendatio ns from the Council based on HAPC considerations under this amendment	receive recommendatio ns from the Council based on HAPC considerations under this amendment. The states might or might	from the Council based on HAPC considerations under this amendment. The states might or might not act on such	The states could receive recommendations from the Council based on HAPC considerations under this amendment. The states might or might not act on such recommendations	The states could receive recommendations from the Council based on HAPC considerations under this amendment. The states might or might not act on such recommendations

Table 2.15 Comparison of US Caribbean Alternatives to minimize gear impacts

Affed Enviro	nment	status quo). Rely on current regulations to minimize, mitigate, or prevent adverse fishing impacts in State and Federal waters of the U.S. Caribbean	Establish modifications to fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval	Alternative 2.5 Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit pots/traps on spawning areas	Alternative 3. Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit traplines on traps/pots in the EEZ 4) prohibit pots/traps on spawning areas 5) prohibit gill/trammel nets on spawning areas 6) prohibit bottom longlines on spawning areas	substantial restrictions on fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) Alternative 3 measures 2) prohibit pots/traps on coral areas 3) prohibit gill/trammel nets on coral areas 4) prohibit SCUBA for use in fishing on coral areas 5) prohibit longlines on coral areas 6) prohibit traplines on pots/traps	or prevent adverse fishing impacts in the EEZ by the following actions: 1) prohibit pots/traps 2) prohibit gill/trammel nets 3) prohibit spears 4) prohibit bottom longlines 5) prohibit vertical gears
	Puerto Rico	direct or indirect	direct or indirect impacts from	No change in direct or indirect impacts from the current state	No change in direct or indirect impacts from the current state	indirect impacts from	No change in direct or indirect impacts from the current state
Physical	USVI	direct or indirect	direct or indirect impacts from	or indirect impacts from the current	No change in direct or indirect impacts from the current state	indirect impacts from the current state	No change in direct or indirect impacts from the current state
		direct or indirect	direct or indirect impacts from the current state		No change in direct or indirect impacts from the current state	indirect impacts from	No change in direct or indirect impacts from the current state
	Estuar- ine	indirect impacts because no estuaries occur	indirect impacts because no		No direct or indirect impacts because no estuaries occur in the EEZ	impacts because no estuaries occur in the	No direct or indirect impacts because no estuaries occur in the EEZ

					Alternative 2. Fetablish	Altamatica 4 Fatablish	Alto mostives E
	fected	Alternative1.		Alternative 2.5	Alternative 3. Establish		Alternative 5.
Envi	ronment	(No Action,	Establish	Establish	modifications to fishing		Establish total
		status quo).		modifications to	gears and close sensitive	0.0	prohibitions on
				fishing gears and	areas to minimize, mitigate,		selected fishing gears
		regulations to	minimize,	close sensitive	or prevent adverse fishing	prevent adverse fishing	
		minimize,	mitigate, or	areas to minimize,	impacts in the EEZ by the		or prevent adverse
						the following actions: 1)	
		prevent adverse		adverse fishing	trip line anchor retrieval 3)		EEZ by the following
				impacts in the EEZ	prohibit traplines on		actions: 1) prohibit
			the following	by the following	traps/pots in the EEZ 4)		pots/traps 2) prohibit
		Federal waters		actions: 1) buoy 2)	prohibit pots/traps on		gill/trammel nets 3)
		of the U.S.	, .	trip line anchor	spawning areas 5) prohibit		prohibit spears 4)
		Caribbean	anchor retrieval	retrieval 3) prohibit	gill/trammel nets on	prohibit SCUBA for use	
				pots/traps on	spawning areas 6) prohibit	in fishing on coral	longlines 5) prohibit
				spawning areas	bottom longlines on	areas 5) prohibit	vertical gears
					spawning areas	longlines on coral	
						areas 6) prohibit	
						traplines on pots/traps	
Biolog-	Marine	No change in	Alternative 2	In addition to the	In addition to the	In addition to the	Alternative 5 would
ical		direct or indirect	would result in	consequences of	consequences of Alternative	consequences of	result in 1), 2), 3), 4),
		impacts from	1) less grappling	Alternative 2,	2 and 2.5, Alternative 3	Alternatives 2, 2.5 and	& 5) the elimination of
		those presently	to recover	Alternative 2.5	would: 3) diminish damage	3, Alternative 4 would:	damage to all EEZ
		occurring. No	unbuoyed traps,	would: 3) reduce	to EEZ habitats, especially	2), 3), 4), 5), & 6)	habitats from gears
		additional	resulting in less	damage (e.g.	corals, from the shearing		with adverse impacts,
		protection for	damage to EEZ	crushing) on	action of trotlines and	snagging, shearing,	but may shift former
		EEZ habitats	habitats,	inferred EEZ	grappling to recover trotline	crushing, grappling) to	EEZ fishing effort to
			especially coral	spawning habitats	traps, but would also	known EEZ coral	state waters and
			and hard	from pots/traps, but	prevent fishers from using	habitat, but would likely	increase habitat
			bottom; 2) less	will likely shift	trotlines in habitats where	shift fishing effort to	damage there
			tendency for	fishing effort to other	they have no adverse	non-prohibition areas	
			anchor to drag	non-closure sites.	effects; 4), 5), & 6) reduce	•	
			when retrieved,		damage (e.g. snagging,		
			resulting in a		shearing, crushing) on		
			decrease in		inferred EEZ spawning		
			damage to EEZ		habitats from fishing gears		
			habitats,		with adverse impacts, but		
			especially		will likely shift fishing effort		
					I Will likely of hit horning chort		

1 a01					ze gear impacts Continued		,
			Alternative 2.	Alternative 2.5	Alternative 3. Establish	Alternative 4.	Alternative 5.
Enviro	nment	(No Action,	Establish	Establish	modifications to fishing gears and	Establish substantial	Establish total
		status quo).	modifications to	modifications to	close sensitive areas to minimize,	restrictions on fishing	prohibitions on
		Rely on			mitigate, or prevent adverse	gears to minimize,	selected fishing
		current	minimize, mitigate, or	close sensitive	fishing impacts in the EEZ by the	mitigate, or prevent	gears to minimize,
		regulations	prevent adverse	areas to	following actions: 1) buoy 2) trip	adverse fishing	mitigate, or prevent
		to minimize,	fishing impacts in the	minimize,	line anchor retrieval 3) prohibit	impacts in the EEZ by	adverse fishing
		mitigate, or	EEZ by the following	mitigate, or	traplines on traps/pots in the EEZ	the following actions:	impacts in the EEZ
		prevent	actions: 1) buoy 2)	prevent adverse	4) prohibit pots/traps on spawning	1) Alternative 3	by the following
		adverse	trip line anchor	fishing impacts in	areas 5) prohibit gill/trammel nets	measures 2) prohibit	actions: 1) prohibit
		fishing	retrieval	the EEZ by the	on spawning areas 6) prohibit	pots/traps on coral	pots/traps 2)
		impacts in		following actions:	bottom longlines on spawning	areas 3) prohibit	prohibit gill/trammel
		State and		1) buoy 2) trip	areas	gill/trammel nets on	nets 3) prohibit
		Federal		line anchor		coral areas 4) prohibit	spears 4) prohibit
		waters of the		retrieval 3)		SCUBA for use in	bottom longlines 5)
		U.S.		prohibit		fishing on coral areas	prohibit vertical
		Caribbean		pots/traps on		5) prohibit longlines	gears
				spawning areas		on coral areas 6)	
						prohibit traplines on	
						pots/traps	
Biolog-			Alternative 2 would		In addition to the consequences of		Alternative 5 would
ical					Alternative 2 and 2.5, Alternative 3		result in 1), 2), 3),
				Alternative 2,	would: 3) diminish damage to	Alternatives 2, 2.5 and	
			unbuoyed traps,		environmental sites of special	l *	elimination of
			resulting in less			2), 3), 4), 5), & 6)	damage to all
				damage (e.g.		eliminate damage	environmental sites
				crushing) on	trotlines and grappling to recover	(e.g. snagging,	of special interest
			•	environmental	trotline traps, but would also	shearing, crushing,	in the EEZ from
				sites of special	prevent fishers from using trotlines		gears with adverse
				interest which	in habitats where they have no		impacts, but may
			less tendency for	are inferred EEZ	adverse effects; 4), 5), & 6) reduce		shift former EEZ
				spawning		are known EEZ coral	fishing effort to
			,	habitats from	J 7	habitat, but would	state waters and
			a decrease in damage			likely shift fishing	increase habitat
				will likely shift	inferred EEZ spawning habitats	effort to non-	damage there
						prohibition areas	
			the EEZ, especially		impacts, but will likely shift fishing		
			coral habitat.	sites.	effort to other non-closure sites.		

			,		inze gear impacts Continued	I	1
			Alternative 2.	Alternative 2.5	Alternative 3. Establish	Alternative 4. Establish	
Enviro	nment	(No Action,	Establish	Establish	modifications to fishing gears		Establish total
		status quo).	modifications to	modifications to	and close sensitive areas to	on fishing gears to	prohibitions on
		-	fishing gears to		minimize, mitigate, or prevent	minimize, mitigate, or	selected fishing gears
		current	minimize, mitigate,	close sensitive	adverse fishing impacts in the	prevent adverse fishing	
			or prevent adverse		EEZ by the following actions: 1)	, .	or prevent adverse
			fishing impacts in		buoy 2) trip line anchor retrieval	the following actions: 1)	
		mitigate, or	the EEZ by the	prevent adverse	3) prohibit traplines on	Alternative 3 measures	EEZ by the following
		prevent	following actions: 1)	fishing impacts in	traps/pots in the EEZ 4) prohibit	prohibit pots/traps	actions: 1) prohibit
		adverse	buoy 2) trip line	the EEZ by the	pots/traps on spawning areas 5)	on coral areas 3)	pots/traps 2) prohibit
		fishing	anchor retrieval	following actions:	prohibit gill/trammel nets on	prohibit gill/trammel	gill/trammel nets 3)
		impacts in			spawning areas 6) prohibit		prohibit spears 4)
		State and			bottom longlines on spawning	prohibit SCUBA for use	
		Federal		prohibit pots/traps	areas	in fishing on coral	longlines 5) prohibit
		waters of the		on spawning		areas 5) prohibit	vertical gears
		U.S.		areas		longlines on coral	
		Caribbean				areas 6) prohibit	
	_					traplines on pots/traps	
Biolog-	Fishery	No change in	Alternative 2 would	In addition to the	In addition to the consequences	In addition to the	Alternative 5 would
ical	res-	direct or	result in 1) less	consequences of	of Alternative 2 and 2.5,	consequences of	result in 1), 2), 3), 4),
Enviro-	ources	indirect	grappling to recover	Alternative 2,	Alternative 3 would: 3) diminish	Alternatives 2, 2.5 and	& 5) the elimination of
nment	under	impacts from	unbuoyed traps,	Alternative 2.5	damage to EEZ habitats used by	3, Alternative 4 would:	damage to all EEZ
	FMPs	those	resulting in less	would: reduce	FMP species, especially corals,	2), 3), 4), 5), & 6)	habitats used by FMP
		presently	damage to EEZ	damage (e.g.	from the shearing action of	eliminate damage (e.g.	species, from gears
		occurring. No	habitats used by	crushing) on	trotlines and grappling to	snagging, shearing,	with adverse impacts,
		additional	FMP species,	inferred EEZ	recover trotline traps, but would	crushing, grappling) to	but may shift former
		protection for	especially coral and	spawning	also prevent fishers from using	known EEZ coral	EEZ fishing effort to
		EEZ habitats	hard bottom; 2) less	habitats, used by	trotlines in habitats where they	habitat used by FMP	state waters and
		used by FMP	tendency for anchor	reef fish from	have no adverse effects; 4), 5),	species. Overall catch	increase habitat
		species	to drag when	pots/traps, but will	& 6) reduce damage (e.g.	of FMP species would	damage there. Reef
			retrieved, resulting	likely shift fishing	snagging, shearing, crushing) on	likely decrease, but	fish and lobster catch
			in a decrease in		inferred EEZ spawning habitats,	fishing effort might shift	in the EEZ would be
			damage to EEZ	closure sites.	used by reef fish, from fishing	to non-prohibition	essentially eliminated.
			habitats used by		gears with adverse impacts, but	areas to make up for	May allow some
			FMP species,		will likely shift fishing effort to	lost catch	recovery by protected
			especially corals.		other non-closure sites.		and overfished
							species
L	1			1		I	

	-				Altomotive 4 Fatablish	Alto months of
rironment	,					Establish total
	. ,					prohibitions on
	•	0 0				selected fishing gears
					į.	
		•	-	,		or prevent adverse
						EEZ by the following
	prevent	following actions: 1)	fishing impacts in		2) prohibit pots/traps	actions: 1) prohibit
	adverse	buoy 2) trip line	the EEZ by the	pots/traps on spawning areas 5)	on coral areas 3)	pots/traps 2) prohibit
	fishing	anchor retrieval	following actions:	prohibit gill/trammel nets on	prohibit gill/trammel	gill/trammel nets 3)
	impacts in					prohibit spears 4)
	State and		anchor retrieval 3)	bottom longlines on spawning	prohibit SCUBA for use	
	Federal		prohibit pots/traps	areas	in fishing on coral	longlines 5) prohibit
	waters of the		on spawning		areas 5) prohibit	vertical gears
	U.S.		areas		longlines on coral	
	Caribbean				areas 6) prohibit	
					traplines on pots/traps	
g Fishery	No change in	Alternative 2 would	In addition to the	In addition to the consequences	In addition to the	Alternative 5 would
res-	direct or	result in 1) less	consequences of	of Alternative 2 and 2.5,	consequences of	result in 1), 2), 3), 4),
ources	indirect	grappling to recover	Alternative 2,	Alternative 3 would: 3) diminish	Alternatives 2, 2.5 and	& 5) the elimination of
not	impacts from	unbuoyed traps,	Alternative 2.5	damage to EEZ habitats used by	3, Alternative 4 would:	damage to all EEZ
under	those	resulting in less	would: 3) reduce	non-FMP species, especially	2), 3), 4), 5), & 6)	habitats used by non-
Caribb-	presently	damage to EEZ	damage (e.g.	corals, from the shearing action	eliminate damage (e.g.	FMP species, from
ean	occurring. No	habitats used by	crushing) on	of trotlines and grappling to	snagging, shearing,	gears with adverse
Council	additional	non-FMP species,	inferred EEZ	recover trotline traps, but would	crushing,grappling) to	impacts, but may shift
FMPs			spawning	also prevent fishers from using	known EEZ coral	former EEZ fishing
	EEZ habitats	hard bottom; 2) less	habitats, used by	trotlines in habitats where they	habitat used by non-	effort to state waters
	used by non-	tendency for anchor	non-FMP reef fish	have no adverse effects; 4), 5),	FMP species. Overall	and increase habitat
	FMP species	to drag when	from pots/traps,	& 6) reduce damage (e.g.	catch of non-FMP	damage there. Non-
	•	retrieved, resulting	but will likely shift	snagging, shearing, crushing) on	species might	FMP reef fish catch in
		in a decrease in	fishing effort to		decrease, but fishing	the EEZ would be
		damage to EEZ	other non-closure		effort might shift to	essentially eliminated
		habitats used by	sites.		non-prohibition areas	
			l			
		non-FMP species,		impacts, but will likely shift	to make up for lost	
		non-FMP species, especially corals.		fishing effort to other non-	catch	
\ \	Affected vironment Og Fishery resources not under Caribbean Council	Affected vironment (No Action, status quo). Rely on current regulations to minimize, mitigate, or prevent adverse fishing impacts in State and Federal waters of the U.S. Caribbean Og Fishery resources in direct or indirect or indirect impacts from those Caribbean occurring. No additional protection for EEZ habitats used by non-	Affected vironment (No Action, status quo). Rely on current regulations to minimize, mitigate, or prevent adverse fishing impacts in State and Federal waters of the U.S. Caribbean Og Fishery res- ources not under Caribbean Og FMPs PMPs Alternative 2. Establish modifications to fishing gears to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval anchor retrieval in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval in 1) less grappling to recover unbuoyed traps, resulting in less damage to EEZ habitats used by non-FMP species, especially coral and hard bottom; 2) less tendency for anchor to drag when retrieved, resulting in a decrease in damage to EEZ habitats used by	Affected vironment Alternative 1. (No Action, status quo). Rely on current regulations to minimize, mitigate, or prevent adverse fishing impacts in State and Federal waters of the U.S. Caribbean Og Fishery ources in ot under Caribbean Og FMPs Og FMPs Og FMPs Og Fishery res- ources in ot under U.S. Caribbean Og FMPs Council FMPs FMPs Alternative 2. Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval Alternative 2. Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit pots/traps on spawning areas Alternative 2.5 Establish modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit pots/traps on spawning areas Alternative 2.5 Establish modifications to fishing gears to mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit pots/traps on spawning areas Alternative 2.5 Establish modifications to fishing gears to mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit pots/traps on spawning areas Og Fishery res- unbuoyed traps, resulting in less damage to EEZ damage (e.g. crushing) on inferred EEZ spawning habitats, used by non-FMP species, especially coral and hard bottom; 2) less tendency for anchor retrieval 3) prohibit pots/traps on spawning areas	Alternative 1. (No Action, status quo). Rely on current regulations to minimize, mitigate, or prevent adverse fishing impacts in State and Federal waters of the U.S. Caribbean Dog Fishery resources not under Caribbean FMPs The Pspecies FMPs The Pspecies FMPs Alternative 2. Establish modifications to fishing gears to modifications to fishing gears and close sensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval spawning areas 5) prohibit pots/traps on spawning areas 6) prohibit pots/traps on spawning a	vironment status quo). Rely on current regulations to fishing gears to minimize, mitigate, or prevent adverse fishing impacts in state and Federal waters of the U.S. Caribbean Pishery resolution alore carbon and Federal waters of the Caribbean Poly Caribbean Alternative 2 would result in 1) less grappling to recover unbuoyed traps, resulting in less damage to EEZ habitats used by non-FMP species, especially coral and additional hard bottom; 2) less damage to EEZ habitats used by non-FMP species, especially coral and additional hard bottom; 2) less damage to EEZ habitats used by non-FMP species, especially coral and additional hard bottom; 2) less poly in prolibit poly fraps, resulting in a decrease in fishing gears and closes ensitive areas to minimize, mitigate, or prevent adverse fishing impacts in the EEZ by the following actions: 1) buoy 2) trip line anchor retrieval 3) prohibit poly fraps on spawning areas 5) prohibit poly fraps on spawning areas 6) prohibit poly fraps on spawni

	fected			Alternative 2.5	Alternative 3. Establish	Alternative 4. Establish	Alternative 5. Establish
				Establish	modifications to fishing gears		total prohibitions on
	TOTILITION	status quo).		modifications to	and close sensitive areas to		selected fishing gears
		Rely on current			minimize, mitigate, or prevent		to minimize, mitigate,
		regulations to	0 0	close sensitive	adverse fishing impacts in the		or prevent adverse
		minimize,	· · · · · · · · · · · · · · · · · · ·		EEZ by the following actions: 1)	i,	fishing impacts in the
		mitigate, or	prevent		buoy 2) trip line anchor retrieval		EEZ by the following
			ļ •	prevent adverse	3) prohibit traplines on		actions: 1) prohibit
		fishing impacts		1.	traps/pots in the EEZ 4) prohibit		pots/traps 2) prohibit
			•	the EEZ by the	pots/traps on spawning areas		gill/trammel nets 3)
					5) prohibit gill/trammel nets on		prohibit spears 4)
		of the U.S.	actions: 1)	1) buoy 2) trip line	spawning areas 6) prohibit	coral areas 4) prohibit	prohibit bottom
		Caribbean	buoy 2) trip line	anchor retrieval 3)	bottom longlines on spawning	SCUBA for use in	longlines 5) prohibit
			anchor retrieval	prohibit pots/traps	areas	fishing on coral areas 5)	vertical gears
				on spawning		prohibit longlines on	
				areas		coral areas 6) prohibit	
						traplines on pots/traps	
Biolog		No change in		Buoys on	Although no US Caribbean	Although no US	Although no US
ical	Mam-	direct or indirect			fishing gears are listed in	Caribbean fishing gears	Caribbean fishing
Enviro		•	'		Category I or II for marine	,	gears are listed in
nmen		those presently	retrieval are	retrieval are not	mammals, marine mammals	or II for marine	Category I or II for
		occurring. No	not expected to		and sea turtles may interact	· · · · · · · · · · · · · · · · · · ·	marine mammals,
	ed	additional	•	change impacts	with gill/trammel nets and are		marine mammals and
	species		impacts on	on marine	being reconsidered for		sea turtles may interact
		EEZ habitats	marine mammals or	mammals or	Category II designation. This Alternative might reduce	gill/trammel nets and are	
		used by marine mammals and	protected	protected species.	interactions with gill/trammel	•	and are being reconsidered for
		protected	species.		nets in the EEZ	This Alternative might	Category II
		species	species.		nets in the LLZ		designation. This
		00000					Alternative would
						0	eliminate interactions
							with gill/trammel nets in
							the EEZ

Tubic		-			ze gear impacts Continued		,
Affec				Alternative 2.5	Alternative 3. Establish	Alternative 4. Establish	Alternative 5. Establish
Enviro	nment	(No Action,	Establish		modifications to fishing	substantial restrictions	total prohibitions on
			modifications	to fishing gears and	gears and close sensitive	on fishing gears to	selected fishing gears to
		Rely on	to fishing gears	close sensitive areas to	areas to minimize,	minimize, mitigate, or	minimize, mitigate, or
		current	to minimize,	minimize, mitigate, or	mitigate, or prevent	prevent adverse fishing	prevent adverse fishing
		regulations to	mitigate, or	prevent adverse fishing	adverse fishing impacts in	impacts in the EEZ by	impacts in the EEZ by the
		minimize,	prevent	impacts in the EEZ by	the EEZ by the following	the following actions: 1)	following actions: 1)
		mitigate, or	adverse fishing	the following actions: 1)	actions: 1) buoy 2) trip line	Alternative 3 measures	prohibit pots/traps 2)
		prevent	impacts in the	buoy 2) trip line anchor	anchor retrieval 3) prohibit	2) prohibit pots/traps on	prohibit gill/trammel nets
		adverse	EEZ by the	retrieval 3) prohibit	traplines on traps/pots in	coral areas 3) prohibit	3) prohibit spears 4)
		fishing	following	pots/traps on spawning		gill/trammel nets on	prohibit bottom longlines
		impacts in	actions: 1)	areas	pots/traps on spawning	coral areas 4) prohibit	5) prohibit vertical gears
		State and	buoy 2) trip line		areas 5) prohibit	SCUBA for use in	
		Federal	anchor retrieval		gill/trammel nets on	fishing on coral areas 5)	
		waters of the			spawning areas 6) prohibit	prohibit longlines on	
		U.S.			bottom longlines on	coral areas 6) prohibit	
		Caribbean			spawning areas	traplines on pots/traps	
Human	Fish-	No change in	No reduction in	Same consequences	Same consequences as	Same consequences as	Alternative 5 would
Environ-	eries	direct or	harvest would	as Alternative 2 plus a	Alternative 2 and 2.5 plus	Alternative 3 plus an	essentially eliminate reef
ment		indirect	be expected,	likely reduction in total	a further likely reduction in	even greater reduction	fish and lobster catch in
		impacts from	unless	harvest due to pot/trap	total harvest due to gear	in total harvest due to	the EEZ, allowing only
		those	increased	prohibitions on inferred	prohibitions on inferred	gear prohibitions on all	hand harvest. The
		presently	costs cause	spawning areas in the	spawning areas in the	mapped coral habitat in	elimination of fisheries in
		occurring.	some EEZ	EEZ. Might cause	EEZ. Might cause fishers	the EEZ throughout the	the EEZ will likely lead to
			fishers to leave	fishers to increase	to increase effort outside	whole year. Might cause	increased fishing effort in
			the fishery.	effort outside of closed	of closed areas to make	fishers to increase effort	state waters, with a more
			Cost to fishers	areas to make up for	up for lost catch. Catch	outside of closed areas	pronounced effect in the
			of \$10-50 per	lost catch. Catch rates	rates outside of spawning	to make up for lost	USVI where a greater
			trap for buoys	outside of spawning	areas are likely to be	catch. Catch rates	proportion of the shelf
			and \$50 per	areas are likely to be	relatively low, resulting in	outside of closed areas	occurs in the EEZ.
			boat for trip line	relatively low, resulting	more time and money	are likely to be lower,	Increased competition
			anchor retrieval	in more time and	spent to obtain the same	resulting in more time	among fishers in a
				money spent to obtain	catch. May cause some	and money spent to	smaller area and heavier
				the same catch. May	fishers to leave fishery.	obtain the same catch.	fishing pressure may lead
				cause some pot/trap		May cause some fishers	to reduced catch rates in
				fishers to leave fishery.		to leave fishery.	state waters.

Affe			Alternative 2.	Alternative 2.5 Establish	Alternative 3. Establish	Alternative 4. Establish	Alternative 5. Establish
		(No Action,	Establish		modifications to fishing	substantial restrictions on	total prohibitions on
		status quo).	modifications to		gears and close sensitive	fishing gears to minimize,	selected fishing gears
		Rely on current		areas to minimize,	10	mitigate, or prevent	to minimize, mitigate,
		regulations to	minimize, mitigate,	mitigate, or prevent	or prevent adverse fishing	adverse fishing impacts in	or prevent adverse
		minimize,	or prevent adverse	adverse fishing impacts in		the EEZ by the following	fishing impacts in the
		mitigate, or	fishing impacts in		following actions: 1) buoy	actions: 1) Alternative 3	EEZ by the following
			the EEZ by the	actions: 1) buoy 2) trip line		measures 2) prohibit	actions: 1) prohibit
		adverse fishing		anchor retrieval 3) prohibit		pots/traps on coral areas	pots/traps 2) prohibit
		impacts in	buoy 2) trip line		traps/pots in the EEZ 4)	3) prohibit gill/trammel	gill/trammel nets 3)
		State and	anchor retrieval	areas	prohibit pots/traps on	nets on coral areas 4)	prohibit spears 4)
		Federal waters			spawning areas 5) prohibit	prohibit SCUBA for use in	prohibit bottom
		of the U.S.			gill/trammel nets on	fishing on coral areas 5)	longlines 5) prohibit
		Caribbean			spawning areas 6) prohibit	prohibit longlines on coral	vertical gears
					bottom longlines on	areas 6) prohibit traplines	
					spawning areas	on pots/traps	
Human	Fishing	No change in	May cause	Controversy may occur	Controversy may occur	Controversy may occur	Controversy may occur
Enviro-	comm-	direct or	controversy among	because fishers see		because fishers see	because fishers see
nment		indirect	EEZ fishers who		areas as too large and	closed areas as too large	closed areas as too
		impacts from	presently use un-		economic losses as too	and economic losses as	large and economic
		those presently	buoyed traps/pots	too great	great	too great	losses as too great.
		occurring.	and/or anchor in the				USVI fishers may also
			EEZ				feel that they would be
							bearing a
							disproportionate
			- , , , ,		-	-	burden
		No change in	There would be	There would be	There would be	There would be	There would be
istrative		direct or	administrative costs	administrative costs	administrative costs	administrative costs	administrative costs
		indirect	associated with		associated with amending	associated with amending	associated with
		impacts from	amending the			the generic FMP or the	amending the generic FMP or the individual
		those presently	generic FMP or the		individual fishery FMPs.	individual fishery FMPs.	
		occurring.	individual fishery FMPs. Enforcement	Enforcement may be difficult due to limited	Enforcement may be difficult due to limited	Enforcement may be difficult due to limited	fishery FMPs. Enforcement may be
			may be difficult due	resources for enforcement		resources for enforcement	
			to limited resources	activities and allowing	activities and allowing	activities and allowing	fishing would be
			for enforcement		some fishing gears while	some fishing gears while	prohibited in the EEZ
			activities	prohibiting others	prohibiting others	prohibiting others	promoted in the LLZ
		l .	activities	promoting outers	Ibrounding onigra	prombining officia	

Table 2.15 Comparison of US Caribbean Alternatives to minimize gear impacts Continued

					<u> </u>	,	
Affec		Alternative1.	Alternative 2.	Alternative 2.5	Alternative 3. Establish		Alternative 5. Establish total
Enviror	nment	(No Action,	Establish				prohibitions on selected
		status quo).	modifications to	modifications to	gears and close	on fishing gears to	fishing gears to minimize,
		Rely on	fishing gears to	0 0	sensitive areas to	minimize, mitigate, or	mitigate, or prevent adverse
		current	minimize,	close sensitive	minimize, mitigate, or		fishing impacts in the EEZ
		regulations to	mitigate, or		prevent adverse fishing	impacts in the EEZ by	by the following actions: 1)
		minimize,	prevent adverse				prohibit pots/traps 2) prohibit
		mitigate, or	fishing impacts in		the following actions: 1)	Alternative 3 measures	, ,
		prevent	the EEZ by the			2) prohibit pots/traps	spears 4) prohibit bottom
		adverse				on coral areas 3)	longlines 5) prohibit vertical
		fishing			traplines on traps/pots in		gears
		impacts in	anchor retrieval		the EEZ 4) prohibit	nets on coral areas 4)	
		State and				prohibit SCUBA for use	
		Federal		pots/traps on	areas 5) prohibit	in fishing on coral	
		waters of the		spawning areas	gill/trammel nets on	areas 5) prohibit	
		U.S.				longlines on coral	
		Caribbean					
					on spawning areas	traplines on pots/traps	
Admin-	State		The states could	The states could		The states could	The states could receive
istrative		direct or	receive	receive	recommendations from	receive	recommendations from the
		indirect	recommendations		the Council based on	recommendations from	
				from the Council	gear impact	the Council based on	impact considerations under
		those	based on gear	based on gear		gear impact	this amendment. The states
		presently	impact	impact		considerations under	might or might not act on
		occurring.	considerations	considerations	states might or might not		such recommendations
			under this	under this	act on such	states might or might	
			amendment. The		recommendations	not act on such	
			states might or	states might or		recommendations	
			might not act on	might not act on			
			such	such			
			recommendations	recommendations			

		Alternatives to	Other act	ions that may address th	reats to EFH and fish	productivity
Affected	Cumulative	prevent, mitigate, or minimize		ent actions not directly mpacts on EFH	Non-fishing indus	tries and development
Environment	Effect	adverse fishing impacts on EFH in the EEZ	Past and present actions	Reasonably foreseeable future actions	Past and present actions	Reasonably foreseeable future actions
Physical Environment	Changes to the physical structure of EFH	No effects	No effects	No effects	Some degraded water quality, dredging, and channelization	Adverse effects will continue into the future, but perhaps at a declining rate; non-fishing impacts main anthropogenic factor adversely affecting habitat
Biological Environment	Changes in the quality of EFH	Successively increasing restrictions of fishing impact alternatives adds increased improvements to EFH in EEZ. Preferred alternative is intermediate in effects. Alternative 5 eliminates damage from most gears. Comparable management in state waters needed for maximum benefits	Current gears with negligible, minor, or moderate habitat effects; adverse effects accumulating at a low rate.	Lower catch and likely lower effort should result in less effects to habitat, if restrictions occur in state and Federal waters	Current non-fishing effects continue to degrade habitat; increasing effect from development partially offset by EFH consultations	Adverse effects will continue into the future, but perhaps at a declining rate; non-fishing impacts main anthropogenic factor adversely affecting habitat

		Alternatives to	Other act	ions that may address th	reats to EFH and fish	productivity
Affected	Cumulative	prevent, mitigate, or minimize adverse fishing		ent actions not directly mpacts on EFH	Non-fishing indus	tries and development
Environment	Effect	impacts on EFH in the EEZ	Past and present actions	Reasonably foreseeable future actions	Past and present actions	Reasonably foreseeable future actions
	Population level effects on FMU species	Fishing impacts alternatives with successively increase in carrying capacity, but little increase in abundance, except Alternative 5 that closes the EEZ	Continue on-going trajectory of heavy fishing and lower than desirable abundance	Population recovery resulting from lower fishing mortality; fish occupy more habitat	Current non-fishing impacts continue to degrade fish productivity; increasing effect from development partially offset by EFH consultation	Adverse effects will continue into the future, but perhaps at a declining rate
	Ecosystem changes	Reductions in habitat damagecould increase availability for ecological functions; fishing impacts alternatives with possible successively increasing coral biodiversity	Continue on-going trajectory of heavy fishing and lower than desirable abundance, resulting in adverse effects to coral ecosystem	Lower catch should result in lower effort, with possible reductions in habitat damage, which would increase availability for ecological functions	Current non-fishing impacts continue with costs to habitat, fish productivity, and ecological functions	Reduced loss of habitat or improvement in habitat would increase availability for ecological functions
	Effects on marine mammals, turtles, and birds	Improvements to EFH may benefit other species using the habitat. Fishing alternatives not expected to change interactions with gear	Some turtle- gill/trammel net interactions, possible marine mammal- gill/trammel net interactions	Lower effort may reduce interactions	Current non-fishing habitat degradation reduces habitat for marine mammals, turtles, and birds	Any habitat loss reduction or habitat improvement may benefit

Table 2.16 Sur	nmary of cumul	lative effects of altern	natives to prevent, mit	igate, or minimize adver	rse fishing impacts in	the EEZ		
		Alternatives to	Other act	Other actions that may address threats to EFH and fish productivity				
Affected	Cumulative	prevent, mitigate, or minimize adverse fishing	•	ent actions not directly mpacts on EFH	Non-fishing indus	tries and development		
Environment	Effect	impacts on EFH in the EEZ	Past and present actions	Reasonably foreseeable future actions	Past and present actions	Reasonably foreseeable future actions		
Administrative Environment	Effects on management and administratio n requirements	Change from status quo would require FMP amendments	Lower than desirable stock abundance under current FMPs	Revisions to FMPs (SFA Amendment) under progress to address management issues	Currently under requirements of various federal and state laws	Increased management requires more monitoring and enforcement		
Administrative	Effects on enforcement requirements	Enforcement of regulations is feasible, but requires additional enforcement resources	Enforcement capabilities strained by current regulations	Increased enforcement from current level needed for compliance; restrictions could include quotas, gear restrictions, closed areas.	Enforcement by various Federal and state agencies	Increased level of monitoring and enforcement possibly needed if restrictions increase		
Human Environment	Net economic change to fishers	Fishing provides small but important revenue (average several thousand dollars per year per fisher); little prospect for improvement	Continue on-going trajectory of heavy fishing and lower than desirable fish abundance and current income	Little or no economic improvement for fishers under open access – dissipation of benefits	Reduced stock abundance from continued habitat degradation would reduce net value of fisheries	Potential benefits to fishers if fish have more available habitat; no increased costs to fishers		
	Effects on development	No change	No change	No change	No change	Consultations could lead to high effects: treatment of pollution, reduced development opportunities, restrictions on industrial plants		

Table 2.17. Practicability summary for alternatives to address adverse fishing impacts

Practicability factors	Alternatives to prevent, mitigate, or minimize adverse fishing impacts in the EEZ								
	1	2	2.5	3	4	5			
Net economic change to fishers	Fishing provides small revenue (only several thousand dollars per year); little prospect for improvement	Little or no economic improvement for fishers under open access; long- term dissipation of benefits; moderate additional short-term costs for anchor triplines and pot/trap buoys	Similar to Alt. 2; moderate additional cost to trap- pot fishers displaced from closed areas	Similar to Alt. 2.5; moderate additional cost to gill/trammel net and bottom longline fishers displaced from closed areas	Similar to Alt. 3; moderate additional cost to pot/trap, gill/trammel net, bottom longline, and SCUBA fishers displaced from coral areas; trapline prohibition decreases efficiency	Major additional costs to pot/trap, gill/trammel net, bottom longline, and spear fishers displaced from EEZ			
Effect on enforcement, management, administratio n	Feasible enforcement requirements, but requires additional resources; no FMP amendments required	Increase enforcement from current level needed for compliance; FMP amendments required	Increase enforcement from Alt. 2 level needed for compliance; legal gears in areas closed to traps increase enforcement difficulty; FMP amendments required	Increase enforcement from Alt. 2.5 level needed for compliance, legal gears in areas closed to traps, gill nets, longlines increase enforcement difficulty	Increase enforcement from Alt. 3 level needed for compliance; legal gears in areas closed to traps, traplines ,gill nets, longlines, SCUBA increase enforcement difficulty	Increase enforcement from status quo level needed for compliance, but likely less than gear and closed areas regs; few legal gears allowed in EEZ			

Table 2.17. Practicability summary for alternatives to address adverse fishing impacts

Practicability factors	Alteri	natives to prevent,	mitigate, or min	imize adverse fi	shing impacts in the	EEZ
	1	2	2.5	3	4	5
Changes in EFH	On-going trajectory of changes – current gears with negligible, minor, or moderate impacts; adverse impacts accumulating at a low rate.	Anchor retrieval may benefit coral, hard bottom, if buoys used with traps less grappling benefits coral, hard bottom, but small amount of total EFH	Same as Alt. 2 plus no trap damage on coral in closed areas, but small amount of total EFH	Same as Alt 2.5 plus reduced shearing, pot dragging if no traplines, and no gill/trammel net and longline damage on coral in closed spawning areas, but small amount of total EFH	Same as Alt. 3 plus no trap, gill/ trammel net, bottom longline, or SCUBA damage on coral in mapped areas; no grappling damage in the EEZ	No damage from trap, gill/ trammel net, bottom longline, or spear
Population effects on FMU species from changes in EFH	Possible minor abundance declines from habitat damage, but minor compared to effects on population of high catch levels	Likely minor change in fish abundance – populations with lowered abundance don't use all available habitat; may improve carrying capacity for future growth in abundance, but without fish to occupy it	Same as Alt. 2, but progressively increased theoretical carrying capacity above Alt. 2	Same as Alt. 2, but progressivel y increased theoretical carrying capacity above Alt. 2.5	Same as Alt. 2, but progressively increased theoretical carrying capacity above Alt. 3	Large area closure likely to reduce harvest, increased theoretical carrying capacity above Alt. 4
Ecosystem changes from changes in EFH	Relatively small adverse impacts have affected mostly coral ecosystems	Any improvements in habitat increase availability for ecological functions	Same as Alt. 2 plus changes in pot/trap effort – possible decreased effort from area closure or possible effort increase in lower CPUE areas	Same as Alt. 2.5 plus effects of changes in effort from gill/ trammel nets and bottom longline	Same as Alt. 3 plus effects of changes in effort from pot/trap, gill/trammel net, bottom longline, and SCUBA fishers displaced from coral habitat and EEZ trapline prohibition	Decreased effort from area closure, possible increase diversity of coral, possible effort increase in lower CPUE areas

Table 3.1 (a) Areal extent (in hectares) of marine biotopes for coastal areas of Puerto Rico and the U.S. Virgin Islands

	<u>Vieques</u>	<u>Culebra</u>	<u>P.R.</u> ¹	St. Thomas	St. John
Lagoons	1,295	68	2,069		
Mangroves Shallow sand	395 686	345 161	3,580 7,327	512	 616
Deep sand Shallow seagrasses	6,440 378	2,179 125	 5,102	 597	 418
Shallow coral reefs Deeper seagrasses and	1,669				
coral assemblages	21,838				669
Other coral reef areas			3,230		
Reef-flat areas		377			
Fringing reefs			409		
Other reef areas		436			
Inshore water		316	33,595		
Turbid water	1,906		245		
Shelf water			99,272		6,637
Cloud and cloud					
Shadows			2,247		

This table is a summary of information presented in "Thematic Mapping of the Coastal Marine Environments of Puerto Rico and the U.S. Virgin Islands" by Roy A. Armstrong.

¹ These numbers correspond only to the main island of Puerto Rico.

Table 3.1 (b) Areal extent (in hectares) of marine biotopes for coastal areas of Puerto Rico and the U.S. Virgin Islands

Habitat	Puerto Rico	US Virgin Islands
Unconsolidated	4,900	2,400
Sediments		
Submerged Aquatic	72,100	161
Vegetation		
Mangrove	7,300	200
Coral Reefs and	75,000	30,000
Colonized Hard		
Bottom		
Total Bottom	160,000	49,000

Source: NOS habitat maps: http://biogeo.nos.noaa.gov/products/benthic/htm/overview.htm

Table 3.2. Classification of habitat types used for the Caribbean fishery management plans.

Substratum Classification	Substratum
Estuarine	Seagrasses
	Mangroves
	Wetlands
	Benthic algae
	Drift algae
	Sand/ Shell bottoms
	Soft bottoms
	Pelagic
Marine	Seagrasses
	Mangroves
	Reefs
	Rubble
	Hardbottoms
	Benthic algae
	Drift algae
	Sand/ Shell bottoms
	Soft bottoms
	Shoals/ Banks
	Pelagic

Table 3.3. Known prey of various FMP species in the US Caribbean

FMP	FAMILY	SPECIES	COMMON NAME	LIFESTAGE	PREY SPECIES
Reef Fish	Serranidae	Epinephelus adscensionis	Rock hind	Adults	Marine crabs, fishes, shrimps, crustaceans, gastropods, and chitons
Reef Fish	Serranidae	Epinephelus cruentatus	Graysby	Adults	Fishes and crustaceans
Reef Fish	Serranidae	Epinephelus flavolimbatus	Yellowedge grouper	Adults	Squid
Reef Fish	Serranidae	Cephalopholis fulva	Coney	Adults	Fishes, shrimps, marine crabs, stomatopods, and crustaceans
Reef Fish	Serranidae	Epinephelus guttatus	Red hind	Larvae	Zooplankton feeders
Reef Fish	Serranidae	Epinephelus guttatus	Red hind	Late juveniles	Crabs, fishes, stomatopods, shrimps, crustaceans and echinoderms
Reef Fish	Serranidae	Epinephelus guttatus	Red hind	Adults	Crabs, fishes, stomatopods, shrimps, crustaceans and echinoderms
Reef Fish	Serranidae	Epinephelus guttatus	Red hind	Spawning adults	Yellowtail snapper, parrotfish, creole wrasse and creole fish
Reef Fish	Serranidae	Epinephelus itajara	Goliath grouper	Adults	Lobster (Panulirus argus) and Scyllardes aequictialis, fishes, crabs, and sea turtles
Reef Fish	Serranidae	Epinephelus mystacinus	Misty grouper	Adults	Fish, wenchman
Reef Fish	Serranidae	Epinephelus striatus	Nassau grouper	Early juveniles	Small grunts
Reef Fish	Serranidae	Epinephelus striatus	Nassau grouper	Adults	Fishes, crabs, stomatopods, cephalopods, shrimps, lobsters, gastopods, isopods, and bivalves
Reef Fish	Serranidae	Mycteroperca venenosa	Yellowfin grouper	Adults	Fishes
Reef Fish	Lutjanidae	Apsilus dentatus	Black snapper	Adults	Fishes, burrowing animals, detritus and pelagic tunicates
Reef Fish	Lutjanidae	Etelis oculatus	Queen snapper	Adults	Fishes, squids, and crustaceans (shrimps and crabs)
Reef Fish	Lutjanidae	Lutjanus analis	Mutton snapper	Late juveniles	Gammarids, fish parts, and Natantia shrimp
Reef Fish	Lutjanidae	Lutjanus analis	Mutton snapper	Adults	Crabs, fishes, gastropods, hermit crabs, lobsters, and stromatopods

Table 3.3. Known prey of various FMP species in the US Caribbean (continued)

FMP	FAMILY	SPECIES	COMMON NAME	LIFESTAGE	PREY SPECIES
Reef Fish	Lutjanidae	Lutjanus apodus	Schoolmaster	Early juveniles	Crustaceans (particularly amphipods), penaenid shrimps, crabs, gammarids, fish parts, ostracods, and brachyuran crabs
Reef Fish	Lutjanidae	Lutjanus apodus	Schoolmaster	Late juveniles	Fishes, crabs, stomatopods, shrimps, gastropods, gammarids, fish parts, ostracods, and brachyuran crabs
Reef Fish	Lutjanidae	Lutjanus apodus	Schoolmaster	Adults	Fishes, crabs, stomatopods, shrimps, and gastropods
Reef Fish	Lutjanidae	Lutjanus buccanella	Blackfin snapper	Early juveniles	Grunts
Reef Fish	Lutjanidae	Lutjanus buccanella	Blackfin snapper	Adults	Fishes, tunicates, and squid
Reef Fish	Lutjanidae	Lutjanus griseus	Gray snapper	Early juveniles	Crustaceans (mainly amphipods and copepods)
Reef Fish	Lutjanidae	Lutjanus griseus	Gray snapper	Late juveniles	Feed in Thalassia beds on amphipods, shrimps, crabs, copepods, gammarids, fish parts, ostracods, and brachyuran crabs
Reef Fish	Lutjanidae	Lutjanus griseus	Gray snapper	Adults	Feeds in Thalassia beds and sandy bottoms. Consume primarily fishes among Red Mangrove roots. Possible prey Jenkinsia Lamprotaenia
Reef Fish	Lutjanidae	Lutjanus jocu	Dog snapper	Late juveniles	Crustaceans
Reef Fish	Lutjanidae	Lutjanus jocu	Dog snapper	Adults	Fishes, crabs, lobsters, gastropods, squids, fish eggs, lobster eggs and crustaceans
Reef Fish	Lutjanidae	Lutjanus mahogoni	Mahogany snapper	Adults	Night-feeding fishes, shrimps, and crabs
Reef Fish	Lutjanidae	Lutjanus synagris	Lane snapper	Late juveniles	Gammarids, Natantia shrimps, and brachyuran crabs
Reef Fish	Lutjanidae	Lutjanus synagris	Lane snapper	Adults	Crabs and stomatopods
Reef Fish	Lutjanidae	Lutjanus vivanus	Silk snapper	Adults	Feeds on invertebrates (crabs and shrimps) and fishes
Reef Fish	Lutjanidae	Ocyurus chrysurus	Yellowtail snapper	Late juveniles	Planktonic organisms; gammarids, fish parts, cumaceans, shrimps, Natantia shrimps, ostracods, brachyuran crabs, fish scales, copepods, prosobranchs, nematodes, isopods, Caprellid, Thorassica, and Errantia
Reef Fish	Lutjanidae	Ocyurus chrysurus	Yellowtail snapper	Adults	Feeds on crabs, shrimps, fishes and their larvae, and fish eggs

Table 3.3. Known prey of various FMP species in the US Caribbean (continued)

FMP	FAMILY	SPECIES SPECIES	COMMON NAME	LIFESTAGE	PREY SPECIES
Reef Fish	Lutjanidae	Pristipomoides macrophtalmus	Wenchman	Adults	Deepwater shrimps and crabs
Reef Fish	Lutjanidae	Rhomboplites aurubens	Vermilion snapper	Adults	Planktonic organisms and crustaceans
Reef Fish	Haemulidae	Haemulon aurolineatum	Tomtate	Late juveniles	Gammarids, cumaceans, Natantia shrimp, copepods, and isopods
Reef Fish	Haemulidae	Haemulon aurolineatum	Tomtate	Adults	Shrimps, polychaetes, crustaceans, hermit crabs, larvae, gastropods, bivalves, crabs (including brachyurans)
Reef Fish	Haemulidae	Haemulon flavolineatum	French grunt	Late juveniles	Copepods, chitons, brachyuran crabs, ostracods, Natantia shrimps, cumacean shrimps, and gammarids
Reef Fish	Haemulidae	Haemulon flavolineatum	French grunt	Adults	Crabs, hermit crabs, shrimps; ontogenic preference in diet (50mm-79m: amphipods,100mm-140mm: gastropods,160mm-189mm: sipunclids and polychaetes)
Reef Fish	Haemulidae	Haemulon plumieri	White grunt	Postlarvae	Plankton
Reef Fish	Haemulidae	Haemulon plumieri	White grunt	Late juveniles	Amphipods, crabs, shrimps, crustaceans, gastropods, ophiurids, polychaetes, sipunclids, gammarids, cumaceans, ostracods, brachyuran crabs, copepods, prosobranchs, nematodes, and chitons
Reef Fish	Haemulidae	Haemulon plumieri	White grunt	Adults	Crabs (xanthid and majid), shrimps; ontogenic changes in diets (70mm-119mm: gastropods, 120-159mm: sipunclids, 160-249: amphipods and ophiuroids), crustaceans, and polychaetes
Reef Fish	Haemulidae	Haemulon sciurus	Bluestriped grunt	Late juveniles	Gammarids, ostracods, polychaete setae, fish scales, Natantia shrimps, cumaceans, and shrimps
Reef Fish	Haemulidae	Haemulon sciurus	Bluestriped grunt	Adults	Crabs, bivalves, amphipods, crustaceans, holothurians, ophiuroids, hermit crabs, and limpets
Reef Fish	Sparidae	Archosargus rhomboidalis	Sea bream	Spawning adults	Green algae, plant detritus, Halophila, red algae, and egg masses
Spiny Lobster	Palinuridae	Panulirus argus	Caribbean spiny lobster	Late juveniles	Mollusks, crustaceans, algae, echinoderms, coelenterates, annelids, and sponges

Table 3.3. Known prey of various FMP species in the US Caribbean (continued)

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FMP	FAMILY	SPECIES	COMMON NAME	LIFESTAGE	PREY SPECIES				
Spiny Lobster	Palinuridae	Panulirus argus	Caribbean spiny lobster	Adults	Mollusks, crustaceans, algae, echinoderms, coelenterates, annelids, and sponges. Feeding takes place in seagrass beds				
Queen Conch	Strombidae	Strombus gigas	Queen conch	Larvae	Small phytoplankton				
Queen Conch	Strombidae	Strombus gigas	Queen conch	Early juveniles	Plankton				
Queen Conch	Strombidae	Strombus gigas	Queen conch	Late juveniles	Feed most actively at night on filamentous and unicellular algae.				
Queen Conch	Strombidae	Strombus gigas	Queen conch	Adults	Epiphytic algae on Thalssia testudinum, algae (Cladophora, Hypnea, Polysiphonia)				

Table 3.4. Summary of distributional information for species other than queen conch (*Strombas gigas*) and *Astrea tuber* in the Queen Conch FMU (Academy of Natural Sciences of Philadelphia 2002)

Trochidae

Cittarium pica

Range: 26.5°N to 9.4°N; 88°W to 59.6°W

Depth: 0 to 2 m (live 0 to 0 m) Maximum Reported Size: 136 mm

Reported Distribution in US Caribbean: Virgin Islands: St. Croix

Strombidae

Strombus pugilis

Range: 26°N to 28.5°S; 83.08°W to 34.9°W

Depth: 0 to 55 m (live 1 to 55 m) Maximum Reported Size: 110 mm

Reported Distribution in US Caribbean: Virgin Islands: St. Croix

Strombus gallus

Range: 32.3°N to 21.62°S; 82°W to 28.9°W

Depth: 0.3 to 82 m (live 0.3 to 48 m) Maximum Reported Size: 197 mm

Reported Distribution in US Caribbean: Virgin Islands: St. John

Strombus costatus

Range: 34.39°N to 21°S; 94°W to 29.3°W

Depth: 2 to 40 m (live 25 to 27 m) Maximum Reported Size: 231 mm

Reported Distribution in US Caribbean: Virgin Islands: St. Croix

Strombus raninus

Range: 34.33°N to 6°S; 93.8°W to 37°W Depth: 0.3 to 55 m (live 0.3 to 6 m) Maximum Reported Size: 121 mm

Reported Distribution in US Caribbean: Virgin Islands: St. Thomas, St. Croix

Cassidae

Cassis flammea

Range: 32.3°N to 9.4°N; 93.8°W to 59.6°W

Depth: 1 to 12 m (live 3 to 5 m) Maximum Reported Size: 154 mm

Reported Distribution in US Caribbean: Virgin Islands: St. Thomas, St. Croix

Table 3.4. Summary of distributional information for species other than queen conch (*Strombas gigas*) and *Astrea tuber* in the Queen Conch FMU (continued)

Cassis madagascariensis

Range: 35°N to 10.5°N; 89.7°W to 64.8°W

Depth: 5 to 30 m (live 27 to 27 m) Maximum Reported Size: 350 mm

Reported Distribution in US Caribbean: Virgin Islands: St. Thomas, St. Croix

Cassis tuberosa

Range: 35°N to 18°S; 92°W to 25°W Depth: 0 to 27 m (live 0 to 9 m) Maximum Reported Size: 301 mm

Reported Distribution in US Caribbean: Virgin Islands: St. Thomas, St. John, St. Croix

Cymatiidae (Ranellidae)

Charonia variegata

Range: 34.39°N to 17°S; 97.28°W to 0°W Depth: 0.3 to 110 m (live 0.3 to 45 m) Maximum Reported Size: 374 mm

Reported Distribution in US Caribbean: Puerto Rico; Puerto Rico: Mona Island; Virgin Islands:

St. Thomas, St. Croix

Fasciolariidae

Fasciolaria tulipa Range: 35°N to 4°N; 97.22°W to 51°W

Depth: 0 to 73 m (live 0.3 to 37 m) Maximum Reported Size: 250 mm

Reported Distribution in US Caribbean: Virgin Islands: St. Croix

Turbinellidae

Vasum muricatum

Range: 26.2°N to 9.4°N; 90.5°W to 64.6°W

Depth: 0 to 15 m (live 0.3 to 15 m) Maximum Reported Size: 125 mm

Reported Distribution in US Caribbean: Puerto Rico; Virgin Islands: St. Thomas, St. John, St.

Croix.

Table 3.5. Scores and ranks for each habitat function for each Caribbean FMP.

3.5a. Example of how scores were assigned

FMP	SubstratumType	Substratum Description	Feeding	Feeding Score
Queen Conch	Marine	Seagrasses	19	8
Queen Conch	Marine	Benthic algae	9	7
Queen Conch	Marine	Hard bottoms	9	7
Queen Conch	Marine	Sand/Shell bottoms	4	5
Queen Conch	Marine	Reef	2	4
Queen Conch	Marine	Pelagic	1	3
Queen Conch	Marine	Rubble	1	3
Queen Conch	Estuarine	Seagrasses	0	0

3.5b. Spawning rankings

Reef Fish FMP Lobster FMP Queen Conch FMP

	Substratum	Substratum	Spawning	Spawning	Substratum	Substratum	Spawning	Spawning	Substratum	Substratum	Spawning	Spawning
	Classification		Score	Rank	Classification		Score	Rank	Classification		Score	Rank
Ī	Marine	Reef	16	1	Marine	Reef	9	1	Estuarine	Seagrasses	8	1
	Marine	Hard bottoms	15	2	Estuarine	Benthic algae	0	N/A	Marine	Sand/Shell	8	1
	Marine	Sand/Shell	14	3	Estuarine	Mangrove	0	N/A	Marine	Seagrasses	8	1
	Marine	Shoals/Banks	14	3	Estuarine	Seagrasses	0	N/A	Marine	Benthic algae	0	N/A
	Marine	Pelagic	14	3	Marine	Benthic algae	0	N/A	Marine	Hard bottoms	0	N/A

Table 3.5. Scores and ranks for each habitat function for each Caribbean FMP (continued)

Reef Fish FMP Lobster FMP Queen Conch FMP

Substratum Classification	Substratum	Spawning Score	Spawning Rank	Substratum Classification	Substratum	Spawning Score	Spawning Rank	Substratum Classification	Substratum	Spawning Score	Spawning Rank
Estuarine	Wetlands	0	N/A	Marine	Hard bottoms	0	N/A	Marine	Pelagic	0	N/A
Estuarine	Mangrove	0	N/A	Marine	Mangrove	0	N/A	Marine	Reef	0	N/A
Estuarine	Sand/Shell	0	N/A	Marine	Pelagic	0	N/A	Marine	Rubble	0	N/A
Estuarine	Seagrasses	0	N/A	Marine	Seagrasses	0	N/A				
Estuarine	Soft bottoms	0	N/A								
Marine	Benthic algae	0	N/A								
Marine	Drift Algae	0	N/A								
Marine	Mangrove	0	N/A								
Marine	Rubble	0	N/A								
Marine	Seagrasses	0	N/A								
Marine	Soft bottoms	0	N/A								

3.5.c Feeding Rankings

Reef Fish FMI)			Lobster FMP				Queen Conch FMP					
Substratum		Feeding	Feeding	Substratum		Feeding	Feeding	Substratum		Feeding	Feeding		
Classification	Substratum	Score	Rank	Classification	Substratum	Score	Rank	Classification	Substratum	Score	Rank		
Marine	Reef	16	1	Marine	Reef	9	1	Marine	Seagrasses	8	1		
Marine	Seagrasses	15	2	Estuarine	Seagrasses	8	2	Marine	Benthic algae	7	2		
Marine	Rubble	14	3	Marine	Hard bottoms	8	2	Marine	Hard bottoms	7	2		
Estuarine	Seagrasses	13	4	Marine	Seagrasses	8	2	Marine	Sand/Shell	5	4		
Marine	Hard bottoms	12	5	Estuarine	Benthic algae	5	5	Marine	Reef	4	5		
Marine	Mangrove	11	6	Estuarine	Mangrove	5	5	Marine	Pelagic	3	6		
Estuarine	Mangrove	10	7	Marine	Benthic algae	5	5	Marine	Rubble	3	6		
Marine	Sand/Shell	9	8	Marine	Mangrove	5	5	Estuarine	Seagrasses	0	N/A		
Marine	Soft bottoms	8	9	Marine	Pelagic	5	5						
Estuarine	Sand/Shell	7	10										
Estuarine	Soft bottoms	7	10										
Estuarine	Wetlands	5	12										
Marine	Shoals/Banks	5	12										
Marine	Benthic algae	5	12										
Marine	Pelagic	2	15										
Marine	Drift Algae	0	N/A	·									

3.5d. Growth rankings.

Reef Fish FMP Lobster FMP Queen Conch FMP

Keel Fish Fivil	<u> </u>			LUDSICI FIVII				Queen Conch Fivil			
Substratum Classification	Substratum	Growth Score	Growth Rank	Substratum Classification	Substratum	Growth Score	Growth Rank	Substratum Classification	Substratum	Growth Score	Growth Rank
Marine	Reef	16	1	Marine	Reef	9	1	Marine	Seagrasses	8	1
Marine	Seagrasses	15	2	Marine	Benthic algae	8	2	Marine	Reef	7	2
Estuarine	Seagrasses	14	3	Marine	Seagrasses	7	3	Marine	Benthic algae	6	3
Marine	Hard bottoms	13	4	Marine	Pelagic	7	3	Marine	Sand/Shell	5	4
Marine	Pelagic	12	5	Estuarine	Seagrasses	5	5	Marine	Hard bottoms	4	5
Marine	Mangrove	11	6	Marine	Hard bottoms	5	5	Marine	Pelagic	3	6
Estuarine	Mangrove	10	7	Estuarine	Benthic algae	5	5	Marine	Rubble	0	N/A
Marine	Rubble	9	8	Estuarine	Mangrove	5	5	Estuarine	Seagrasses	0	N/A
Marine	Sand/Shell	8	9	Marine	Mangrove	5	5				
Marine	Soft bottoms	7	10								
Marine	Benthic algae	7	10								
Estuarine	Wetlands	7	10								
Marine	Drift Algae	4	13								
Estuarine	Sand/Shell	3	14								
Estuarine	Soft bottoms	3	14								
Marine	Shoals/Banks	0	N/A								

Table 3.6. Scores for habitat use (for feeding, growth to maturity, and spawning) and ranks for ecological importance for each Caribbean FMP.

REEF FISH FMP

	KEEF FISH FMI					
Aquatic	Habitat	Feeding	Growth	Spawning	Mean	Rank
sector		Score	Score	Score	Score	
Marine	Reef	16	16	16	16.0	1
Marine	Hard bottoms	12	13	15	13.3	2
Marine	Sand/Shell bottoms	9	8	14	10.3	3
Marine	Seagrasses	15	15	0	10.0	4
Marine	Pelagic	2	12	14	9.3	5
Estuarine	Seagrasses	13	14	0	9.0	6
Marine	Rubble	14	9	0	7.7	7
Marine	Mangrove	11	11	0	7.3	8
Estuarine	Mangrove	10	10	0	6.7	9
Marine	Shoals/Banks	5	0	14	6.3	10
Marine	Soft bottoms	8	7	0	5.0	11
Marine	Benthic algae	5	7	0	4.0	12
Estuarine	Wetlands	7	5	0	4.0	12
Estuarine	Sand/Shell bottoms	7	3	0	3.3	14
Estuarine	Soft bottoms	7	3	0	3.3	14
Marine	Drift Algae	0	4	0	1.3	16

LOBSTER FMP

Aquatic	Habitat	Feeding	Growth	Spawning	Mean	Rank
sector		Score	Score	Score	Score	
Marine	Reef	9	9	9	9.0	1
Marine	Seagrasses	8	7	0	5.0	2
Estuarine	Seagrasses	8	5	0	4.3	3
Marine	Hard bottoms	8	5	0	4.3	3
Marine	Benthic algae	5	8	0	4.3	3
Marine	Pelagic	5	7	0	4.0	6
Estuarine	Benthic algae	5	5	0	3.3	7
Estuarine	Mangrove	5	5	0	3.3	7
Marine	Mangrove	5	5	0	3.3	7

Table 3.6. Scores for habitat use (for feeding, growth to maturity, and spawning) and ranks for ecological importance for each Caribbean FMP. (continued)

QUEEN CONCH FMP

Aquatic	Habitat	Feeding	Growth	Spawning	Mean	Rank
sector		Score	Score	Score	Score	
Marine	Seagrasses	8	8	8	8.0	1
Marine	Sand/Shell bottoms	5	5	8	6.0	2
Marine	Benthic algae	7	6	0	4.3	3
Marine	Hard bottoms	7	4	0	3.7	4
Marine	Reef	4	7	0	3.7	4
Estuarine	Seagrasses	0	0	8	2.7	6
Marine	Pelagic	3	3	0	2.0	7
Marine	Rubble	3	0	0	1.0	8

Table 3.7. Distribution by coast and size of fishing vessels in Puerto Rico, 1975 (Suárez-Caabro 1979).

Number of fishing vessels by length (feet)

COAST	~1 <i>5</i>	16 21	22.20	21.26	> 26	TOTALS
COAST	<15	16-21	22-30	31-36	>36	
North	14	100	7	1	1	123
East	27	80	27	4	0	138
South	90	163	7	2	4	266
West	92	219	22	2	3	338
TOTALS	223	562	63	8	8	865

Table 3.8. Number of certificates issued to boats in Puerto Rico (USCG).

FEET	NUMBER	COMMENTS
<16	22,725	Includes personal watercrafts
16<26	16,322	
26<40	4,001	
40<65	961	
>65	40	
TOTAL	44,049	
CATEGORIES		
Commercial Passenger	36	
Commercial Fishing	4,112	
Commercial Other	62	
Personal Watercrafts	9,156	

Table 3.9. Number of fishing vessels and motors reported in Puerto Rico's commercial fishery during 1995-96 (Matos-Caraballo 1997).

Number of fishing vessels by length (feet)

COAST	<15	16-21	22-29	30-39	40-64	>65	TOTAL
North	91	232	41	3	0	0	367
East	95	197	68	10	2	0	372
South	108	280	28	2	2	0	420
West	75	206	51	5	5	0	342
TOTALS	369	915	188	20	9	0	1501

Table 3.10. U. S. Virgin islands fishing ports, licensed commercial and boat classes by island group, 1991-92. * = Fishing ports = Landing sites ** = Unknown (Annual Summary Report 1992-1993. U. S. Virgin Islands Division of Fish and Wildlife/National Marine Fisheries Service Cooperative Fishery Statistics Program #SF-42 (NA90AAHSF228).

Number of fishing vessels by length (feet)

Island Group	*Fishing Ports	Commercial Fishers	<15	16-25	26-39	40-64	>65	U**
STT-STJ	10	230	36	113	30	3	0	48
STX	17	197	30	155	10	2	0	

Table 3.11. Boat registration fees in the U.S. Virgin Islands

Boat Class	Pleasure	Commercial/Charter
Less than 16'	\$25	\$37.50
Class 1 - 16' but less than 26'	\$50	\$75
Class 2 - 26' but less than 40'	\$100	\$150
Class 3 - 40' but less than 65'	\$150	\$225
Class 4 - greater than 65'	\$200	\$300 max.

Table 3.12. Average fishery landings for 11 finfish groups, spiny lobster, and conch for the U.S. Caribbean (Puerto Rico and the U.S. Virgin Islands). (From CFMC Draft SFA Generic Amendment).

Average commercial fishery landings for 20 finfish groups, spiny lobster, and conch for the U.S. Caribbean (Puerto Rico and the U.S. Virgin Islands). Yearly commercial landings are shown for Puerto Rico from 1997 - 2001. Average total Virgin Island finfish landings (1,346,553 pounds; averaged over 5 years) are combined proportionately to Puerto Rico landings as

a best estimate of total	U.S.	Caribbean	landings	(last	column).

STOCK	1997	1998	1999	2000	2001	Total	PR Avg	% of Grp	USVI adj	Landings
SNAPPER										
Unit 1										
SNAPPER,BLACK		207	672	403	20	1302	326			
SNAPPER,BLACKFIN	822	3689	4342	10652	9940	29445	5889			
SNAPPER, VERMILIO	14022	16585	17240	22177	44891	114915	22983			
SNAPPER,SILK	285787	209384	224818	187639	282159	1189787	237957	12.08%	162,684	429,839
Unit 2										
SNAPPER,QUEEN	38778	46073	66695	82828	107671	342045	68409			
WENCHMAN	542	2303	3645	4953	7731	19174	3835	3.27%	53,450	125,694
Unit 3										
SNAPPER,GRAY		3	10	85	53	151	38			
SNAPPER,LANE	270275	221030	196988	204314	186580	1079187	215837			
SNAPPER,MUTTON	76602	77437	96377	84256	90583	425255	85051			
SNAPPERS,UNC	66957	55989	62110	48934	58468	292458	58492			
SNAPPER,DOG	10		78	75	1537	1700	425			
SNAPPER,SCHOOLM.	15	107	146	10	29	307	61			
SNAPPER,MAHOGAN	978	274	43	41	7	1343	269	16.29%	219,327	579,500
Unit 4										
SNAPPER,YELLOWTA	273088	252087	279467	360624	328961	1494227	298845	13.51%	181,982	480,827
GROUPER										
Unit 1										
GROUPER,NASSAU	15474	19107	14971	12947	18706	81205	16241	0.73%	9,890	26,131
Unit 2										
GOLIATH	85	142		27	50	304	76	0.0034%	46	122

Table 1. Continued.										
STOCK	1997	1998	1999	2000	2001	Total	PR Avg	% of Grp	USVI adj	Landings
Unit 3										
HIND,RED	60253	55012	65974	60901	69098	311238	62248			
CONEY	12103	13877	10262	11544	15929	63715	12743			
HIND,ROCK		113		113		226	113			
GRAYSBY			25			25	25			
CREOLE FISH				43		43	43	3.40%	45,776	120,947
Unit 4										
GROUPER,RED	18		7		28	53	18			
GROUPER,MISTY	4349	5562	6718	5246	6222	28097	5619			
GROUPER,BLACK						0	0			
GROUPER,TIGER						0	0			
GROUPER, YELLOWF	2088	1793	3350	11208	3708	22147	4429			
GROUPER, YELLOWE	DGE									
GROUPER UNC	72655	43197	47891	40632	54005	258380	51676	2.79%	37,598	99,341
REEFFISHES										
GRUNTS										
GRUNT,WHITE	164401	112694	117124	114982	155878	665079	133016			
MARGATE	3612	2675	990	864	437	8578	536			
GRUNT,BLUESTRIPE	101	28	109	12	5	255	20			
GRUNT,FRENCH	7					7	7			
GRUNT,TOMTATE						0	0			
PORKFISH						0	0			
GRUNTS UNC	190	234		57	88	569	142	6.05%	81,429	215,150
GOATFISH										
GOATFISH,SPOTTED		11532	22340	16065		80192	16038			
GOATFISH, YELLOW	4697	3478	3866	4266		22558	4512			
GOATFISHES	6			103	75	184	61	0.93%	12,551	33,163

Table 3.12 Continued

STOCK	1997	1998	1999	2000	2001	Total	PR Avg	% of Grp	USVI adj	Landings
PORGIES										
PORGIES,UNC	28431	26549	34586	28883	36374	154823	30965			
PORGY,JOLTHEAD					619	619	619			
PORGY,SHEEPSHEAD										
SEA BREAM		6				6	1			
PORGY,PLUMA				30	31	61	31	1.43%	19,252	50,867
SQUIRRELFISH										
SQUIRRELFISHES UN	21420	18773	14591	15689	18264	88737	17747			
SQUIRRELFISH	184	234	112	127	49	706	141			
SOLDIERFISH,BLACKE	BAR					0	0	0.81%	10,893	28,782
TILEFISH										
TILEFISHES	131			10		141	71			
TILEFISH,BLACKLIN	9	156	996	209	105	1475	295			
TILEFISH,SAND	463	464	12	18	105	957	239	0.027%	368	973
JACKS										
BLUE RUNNER	86	19	1			106	35			
HORSE-EYE JACK	1878	6126	5109	7568	6607	27288	5458			
BLACK JACK	10/0	0120	3109	7308	0007	2/288	0			
			17		051	-				
ALMACO JACK	24520	25100	17	44500	851	868	434			
BAR JACK	24528	27180	40913	44680	50845	188146	37629			
GREATER AMBERJA	802	270	151	7	8	1238	248			
JACK,YELLOW	426	3314	2021	2460	3934	12155	2431			
JACKS UNC	55394	35739	29999	29703	36415	187250	37450	3.78%	50,960	134,645
Table 1. Continued										
STOCK	1997	1998	1999	2000	2001	Total	PR Avg	% of Grp	USVI adj	Landings
PARROTFISHES										
PARROTFISH,MIDNIGE	HT									
PARROTFISH,STRIPED	,									
PARROTFISH, PRINCES	S									
PARROTFISH,QUEEN										
PARROTFISH,REDBAN	ID									
PARROTFISH, REDFIN										
PARROTFISH,BLUE	5	15	10		72	102	26			
PARROTFISH, RAINBO	W		11			11	6			
PARROTFISH,REDTAII			116			116	116			
PARROTFISH,STOPLI	44	61	30	12	9	156	31			
PARROTFISH,STOPLI PARROTFISH UNC		61 97503		12 72865	9 99174		31 92207	4.18%	56,258	148,642
	44		30		9 99174	156		4.18%	56,258	148,642
PARROTFISH UNC SURGEONFISH	44		30		9 99174	156		4.18%	56,258	148,642
PARROTFISH UNC SURGEONFISH DOCTORFISH	44		30		9 99174	156 461033	92207	4.18%	56,258	148,642
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON,OCEAN	44 110944		30 80547			156 461033				148,642
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON,OCEAN SURGEONFISHES UNC	44 110944		30 80547 9		9 99174 20	156 461033	92207 9	4.18% 0.0008%	56,258	
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON,OCEAN SURGEONFISHES UNC TRIGGERFISH AND F	44 110944		30 80547 9			156 461033	92207 9			
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON,OCEAN SURGEONFISHES UNC TRIGGERFISH AND F FILEFISH,SCRAWLED	44 110944 		30 80547 9			156 461033	92207 9			
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON, OCEAN SURGEON, FISHES UNC TRIGGERFISH AND FILEFISH, SCRAWLED FILEFISH, WHITESPOT	44 110944 ILEFISH	97503 4	30 80547 9 4	72865	20	156 461033 9 28	92207 9 9 9			
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON,OCEAN SURGEONFISHES UNC TRIGGERFISH AND F FILEFISH,SCRAWLED FILEFISH,WHITESPOT TRIGGERFISHES UNC	44 110944 ILEFISH TED 22		30 80547 9 4	72865		156 461033 9 28	92207 9 9 9			
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON,OCEAN SURGEONFISHES UNC TRIGGERFISH AND F FILEFISH,SCRAWLED FILEFISH,WHITESPOT TRIGGERFISHES UNC TRIGGERFISH, OCEA	44 110944 ILEFISH TED 22 82	97503 4	30 80547 9 4	72865 102 5	20	156 461033 9 28 210 380	92207 9 9 9 42 127			
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON,OCEAN SURGEONFISHES UNC TRIGGERFISH AND F FILEFISH,SCRAWLED FILEFISH,WHITESPOT TRIGGERFISHES UNC TRIGGERFISHES UNC TRIGGERFISH, OCEA DURGON,BLACK	44 110944 ILEFISH TED 22 82 24	97503 4 5	30 80547 9 4 28 293	72865	20	156 461033 9 28 210 380 755	92207 9 9 9 42 127 378			
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON,OCEAN SURGEONFISHES UNC TRIGGERFISH AND F FILEFISH,SCRAWLED FILEFISH,WHITESPOT TRIGGERFISHES UNC TRIGGERFISH, OCEA DURGON,BLACK TRIGGERFISH,SARG	### 110944 ##################################	97503 4 5	30 80547 9 4 28 293	72865 102 5 731	20 53	156 461033 9 28 210 380 755 131	92207 9 9 9 42 127 378 33	0.0008%	11	29
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON,OCEAN SURGEONISHES UNC TRIGGERFISH AND F FILEFISH,SCRAWLED FILEFISH,WHITESPOT TRIGGERFISHES UNC TRIGGERFISH, OCEA DURGON,BLACK TRIGGERFISH,SARGA TRIGGERFISH,QUEEN	44 110944 ILEFISH TED 22 82 24	97503 4 5	30 80547 9 4 28 293	72865 102 5	20	156 461033 9 28 210 380 755	92207 9 9 9 42 127 378			
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON, OCEAN SURGEON, OCEAN FILLEFISH, SCRAWLED FILLEFISH, SCRAWLED FILLEFISH, WHITESPOT TRIGGERFISHES UNC TRIGGERFISH, OCEA DURGON, BLACK TRIGGERFISH, SARGA TRIGGERFISH, QUEEN BOXFISH	44 110944 ILEFISH TED 22 82 24 6 73200	97503 4 5	30 80547 9 4 28 293	72865 102 5 731	20 53	156 461033 9 28 210 380 755 131 288907	92207 9 9 9 42 127 378 33 57781	0.0008%	11	29
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON, OCEAN SURGEON, OCEAN SURGEON, SHEEPISH, SURGERFISH AND FILEFISH, WHITESPOT TRIGGERFISH, WHITESPOT TRIGGERFISH, OCEA DURGON, BLACK TRIGGERFISH, ACEA DURGON, BLACK TRIGGERFISH, OLEA BOXFISH COWFISH, HONEYCOM	44 110944 ILEFISH TED 22 82 24 6 73200	97503 4 5 15 64448	30 80547 9 4 28 293 92 49591	72865 102 5 731	20 53 18 60858	156 461033 9 28 210 380 755 131 288907	92207 9 9 9 42 127 378 33 57781	0.0008%	11	29
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON,OCEAN SURGEONFISHES UNC TRIGGERFISH AND F FILEFISH,SCRAWLED FILEFISH,WHITESPOT TRIGGERFISHS UNC TRIGGERFISH, OCEA DURGON,BLACK TRIGGERFISH,SARG, TRIGGERFISH,QUEE BOXFISH COWFISH,HONEYCOM TRUNKFISH	44 110944 ILEFISH TED 22 82 24 6 73200 IB 898	97503 4 5 15 64448	30 80547 9 4 28 293 92 49591	72865 102 5 731 40810	20 53 18 60858	156 461033 9 28 210 380 755 131 288907 0 1802	92207 9 9 9 127 378 33 57781 0 451	0.0008% 2.64%	35,538	29 93,899
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON,OCEAN SURGEONISHES UNC TRIGGERFISH AND F FILEFISH,SCRAWLED FILEFISH,WHITESPOT TRIGGERFISHS UNC TRIGGERFISH, OCEA DURGON,BLACK TRIGGERFISH,SARG, TRIGGERFISH,QUEEN BOXFISH COWFISH,HONEYCOM TRUNKFISH BOXFISH	44 110944 ILEFISH TED 22 82 24 6 73200	97503 4 5 15 64448	30 80547 9 4 28 293 92 49591	72865 102 5 731	20 53 18 60858	156 461033 9 28 210 380 755 131 288907	92207 9 9 9 42 127 378 33 57781	0.0008%	11	29
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON,OCEAN SURGEONISHES UNC TRIGGERFISH AND F FILEFISH,SCRAWLED FILEFISH,WHITESPOT TRIGGERFISHES UNC TRIGGERFISH, OCEA DURGON,BLACK TRIGGERFISH,QUEET BOXFISH COWFISH,HONEYCOM TRUNKFISH BOXFISH WRASSES	HLEFISH TED 22 82 24 6 73200 IB 898 80995	97503 4 5 15 64448 224 90713	30 80547 9 4 28 293 92 49591 175 83758	72865 102 5 731 40810	20 53 18 60858 505 77309	156 461033 9 28 210 380 755 131 288907 0 1802 416355	92207 9 9 9 42 127 378 33 57781 0 451 21913	0.0008% 2.64%	35,538	29 93,899
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON, OCEAN SURGEONFISHES UNC TRIGGERFISH AND F FILEFISH, SCRAWLED FILEFISH, WHITESPOT TRIGGERFISHES UNC TRIGGERFISH, OCEA DURGON, BLACK TRIGGERFISH, OUEE BOXFISH COWFISH, HONEYCOM TRUNKFISH BOXFISH WRASSES HOGFISH, SPANISH	44 110944 ILEFISH TED 22 82 24 6 73200 IB 898	97503 4 5 15 64448	30 80547 9 4 28 293 92 49591	72865 102 5 731 40810	20 53 18 60858 505 77309	156 461033 9 28 210 380 755 131 288907 0 1802 416355	92207 9 9 9 42 127 378 33 57781 0 451 21913	0.0008% 2.64%	35,538	29 93,899
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON,OCEAN SURGEONISHES UNC TRIGGERFISH AND F FILEFISH,SCRAWLED FILEFISH,WHITESPOT TRIGGERFISHES UNC TRIGGERFISH, OCEA DURGON,BLACK TRIGGERFISH,QUEET BOXFISH COWFISH,HONEYCOM TRUNKFISH BOXFISH WRASSES	HLEFISH TED 22 82 24 6 73200 IB 898 80995	97503 4 5 15 64448 224 90713	30 80547 9 4 28 293 92 49591 175 83758	72865 102 5 731 40810	20 53 18 60858 505 77309	156 461033 9 28 210 380 755 131 288907 0 1802 416355	92207 9 9 9 42 127 378 33 57781 0 451 21913	0.0008% 2.64%	35,538	29 93,899
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON, OCEAN SURGEONFISHES UNC TRIGGERFISH AND F FILEFISH, SCRAWLED FILEFISH, WHITESPOT TRIGGERFISHES UNC TRIGGERFISH, OCEA DURGON, BLACK TRIGGERFISH, OUEE BOXFISH COWFISH, HONEYCOM TRUNKFISH BOXFISH WRASSES HOGFISH, SPANISH	HLEFISH TED 22 82 24 6 73200 IB 898 80995	97503 4 5 15 64448 224 90713	30 80547 9 4 28 293 92 49591 175 83758	72865 102 5 731 40810	20 53 18 60858 505 77309	156 461033 9 28 210 380 755 131 288907 0 1802 416355	92207 9 9 9 42 127 378 33 57781 0 451 21913	0.0008% 2.64%	35,538	29 93,899
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON, CEAN SURGEON, CEAN SURGEON, SEAN FILLEFISH, SCRAWLED FILLEFISH, SCRAWLED FILLEFISH, WHITESPOT TRIGGERFISHES UNC TRIGGERFISH, OCEA DURGON, BLACK TRIGGERFISH, OCEA DURGON, BLACK TRIGGERFISH, QUEEN BOXFISH COWFISH, HONEYCOM TRUNKFISH BOXFISH WWASSES HOGFISH, SPANISH PUDDINGWIFE	110944 110944 11EFISH 11ED 22 82 24 6 73200 11B 898 80995	97503 4 5 15 64448 224 90713 360	30 80547 9 4 28 293 92 49591 175 83758	72865 102 5 731 40810	20 53 18 60858 505 77309 11	156 461033 9 28 210 380 755 131 288907 0 1802 416355	92207 9 9 9 9 42 127 378 33 57781 0 451 21913	0.0008% 2.64%	35,538	29 93,899
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON,OCEAN SURGEON,OCEAN SURGEONFISHES UNC TRIGGERFISH AND F FILEFISH,SCRAWLED FILEFISH,WHITESPOT TRIGGERFISHS UNC TRIGGERFISHS UNC TRIGGERFISH, OCEA DURGON,BLACK TRIGGERFISH,ARG, TRIGGERFISH,QUEEN BOXFISH COWFISH,HONEYCOM TRUNKFISH BOXFISH WRASSES HOGFISH,SPANISH PUDDINGWIFE WRASSES	110944 110944 ILEFISH TED 22 82 24 6 73200 IB 898 80995	97503 4 4 5 15 64448 224 90713 360 37	30 80547 9 4 28 293 92 49591 175 83758 218	72865 102 5 731 40810 83580	53 18 60858 505 77309 11 104 12	156 461033 9 28 210 380 755 131 288907 0 1802 416355 764 104	92207 9 9 9 127 378 33 57781 0 451 21913 153 104 24 58297	2.64% 1.01%	35,538 13,618	93,899 35,982
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON,OCEAN SURGEON,OCEAN SURGEONFISHES UNC TRIGGERFISH AND F FILEFISH,SCRAWLED FILEFISH,WHITESPOT TRIGGERFISHS UNC TRIGGERFISHS UNC TRIGGERFISH, OCEA DURGON,BLACK TRIGGERFISH,ARG, TRIGGERFISH,QUEEN BOXFISH COWFISH,HONEYCOM TRUNKFISH BOXFISH WRASSES HOGFISH,SPANISH PUDDINGWIFE WRASSES	110944 110944 ILEFISH TED 22 82 24 6 73200 IB 898 80995	97503 4 4 5 15 64448 224 90713 360 37	30 80547 9 4 28 293 92 49591 175 83758 218	72865 102 5 731 40810 83580 31	53 18 60858 505 77309 11 104 12	156 461033 9 28 210 380 755 131 288907 0 1802 416355 764 104 72 291483	92207 9 9 9 127 378 33 57781 0 451 21913 153 104 24 58297	2.64% 1.01%	35,538 13,618	93,899 35,982 94,248
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON,OCEAN SURGEON,OCEAN SURGEONISHES UNC TRIGGERFISH AND F FILEFISH,SCRAWLED FILEFISH,WHITTESPOT TRIGGERFISHS UNC TRIGGERFISHS UNC TRIGGERFISH, OCEA DURGON,BLACK TRIGGERFISH,QUEET BOXFISH COWFISH,HONEYCOM TRUNKFISH BOXFISH WRASSES HOGFISH,SPANISH PUDDINGWIFE WRASSES HOGFISH	HLEFISH TED 22 82 24 6 73200 IB 898 80995 144 23 68577	97503 4 4 5 15 64448 224 90713 360 37	30 80547 9 4 28 293 92 49591 175 83758 218	72865 102 5 731 40810 83580 31	53 18 60858 505 77309 11 104 12	156 461033 9 28 210 380 755 131 288907 0 1802 416355 764 104 72 291483	92207 9 9 9 127 378 33 57781 0 451 21913 153 104 24 58297	2.64% 1.01%	35,538 13,618	93,899 35,982 94,248
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON,OCEAN SURGEONISHES UNC TRIGGERFISH AND F FILEFISH,SCRAWLED FILEFISH,WHITESPOT TRIGGERFISHES UNC TRIGGERFISHS, OCEA DURGON,BLACK TRIGGERFISH,OUEEN BOXFISH COWFISH,HONEYCOM TRUNKFISH BOXFISH WRASSES HOGFISH,SPANISH PUDDINGWIFE WRASSES HOGFISH,SPANISH PUDDINGWIFE WRASSES HOGFISH	HLEFISH TED 22 82 24 6 73200 IB 898 80995 144 23 68577	97503 4 4 5 15 64448 224 90713 360 37	30 80547 9 4 28 293 92 49591 175 83758 218	72865 102 5 731 40810 83580 31	53 18 60858 505 77309 11 104 12	156 461033 9 28 210 380 755 131 288907 0 1802 416355 764 104 72 291483 8,661,145	92207 9 9 9 127 378 33 57781 0 451 21913 153 104 24 58297	2.64% 1.01%	35,538 13,618	93,899 35,982 94,248
PARROTFISH UNC SURGEONFISH DOCTORFISH SURGEON, OCEAN SURGEON, OCEAN SURGEONFISHES UNC TRIGGERFISH AND F FILEFISH, SCRAWLED FILEFISH, WHITESPOT TRIGGERFISHSES UNC TRIGGERFISH, OCEA DURGON, BLACK TRIGGERFISH, OUEE BOXFISH COWFISH, HONEYCOM TRUNKFISH BOXFISH WRASSES HOGFISH, SPANISH PUDDINGWIFE WRASSES HOGFISH, SPANISH PUDDINGWIFE WRASSES HOGFISH LOBSTER LOBSTER, SPOTTED SP	110944 11	97503 4 4 5 15 64448 224 90713 360 37 49570	30 80547 9 4 28 293 92 49591 175 83758 218	72865 102 5 731 40810 83580 31 58230 Finfish Total =	20 53 18 60858 505 77309 11 104 12 68716	156 461033 9 28 210 380 755 131 288907 0 1802 416355 764 104 72 291483 8,661,145	92207 9 9 9 9 42 127 378 33 57781 0 451 21913 153 104 24 58297 1,671,478	2.64% 1.01%	35,538 13,618 35,671 1,027,303	93,899 93,899 35,982 94,248 2,698,782

Table 3.13 Marine recreational fisheries statistics (MRFFS data) (From MRFSS web page)

Year: 2000

Year: 2000 Weights are for Catch Type A + B1 only								
Trongin.	State Waters		EEZ					
Species	Weight (lbs)	PSE	Weight (lbs)	PSE				
BARRACUDAS	g ()		rroight (ibo)					
BARRACUDAS	118,563	48.7						
Species Group Subtotal	118,563	48.7						
CARTILAGINOUS FISHES	110,000	40.7						
OTHER SHARKS	11,554	0						
SKATES/RAYS	17,059	0						
Species Group Subtotal	28,614	0						
DOLPHINS	20,014	<u> </u>						
DOLPHINS	1,034,700	23.7						
Species Group Subtotal	1,034,700	23.7						
DRUMS	1,004,700	20.7						
ATLANTIC CROAKER	2,930	66.6	T					
KINGFISHES	2,330	0						
OTHER DRUM	1,468	40						
RED DRUM	0	0						
Species Group Subtotal	4,398	46.3						
EELS	4,390	40.5						
EELS	0	0						
Species Group Subtotal	0	0						
FLOUNDERS	<u> </u>	<u> </u>						
OTHER FLOUNDERS	86	0						
Species Group Subtotal	86	0						
GRUNTS	00	Ч						
OTHER GRUNTS	27,031	20.9						
WHITE GRUNT	3,668	64						
Species Group Subtotal	30,699	19.9						
HERRINGS	30,099	19.9						
HERRINGS	64,826	94.6						
Species Group Subtotal	64,826	94.6						
JACKS	04,820	34.0						
BLUE RUNNER	2,172	20.7	0	0				
CREVALLE JACK	32,573	58.3	0					
FLORIDA POMPANO	32,373	0						
GREATER AMBERJACK	27,022	48.6	1041					
OTHER JACKS	31,535	14.4	2683	65.5				
Species Group Subtotal	93,387	25.2	3724	05.5				
MULLETS	33,307	20.2	3124					
MULLETS	0.100	36.6	I					
	9,182							
Species Group Subtotal OTHER FISHES	9,182	36.6						
	000.404	E0	24050	20.0				
OTHER FISHES	602,464	59	21058	39.6				

Table 3.13 Marine recreational fisheries statistics (MRFFS data) (continued)

Table 3.13 Marme recreational fisheries stati	State Waters		EEZ	
Species	Weight (lbs)	PSE	Weight (lbs)	PSE
Species Group Subtotal	602,464	59	21058	39.6
PORGIES	<u> </u>	•		
OTHER PORGIES	2,970	50.1	730	0
Species Group Subtotal	2,970	50.1	730	0
PUFFERS				
PUFFERS	5,280	33.4		
Species Group Subtotal	5,280	33.4		
SEA BASSES				
EPINEPHELUS GROUPERS	23,849	22.6	13441	21.8
OTHER SEA BASSES	17,260	30.2	2394	64.3
Species Group Subtotal	41,109	18.3	15835	20.9
SEAROBINS				
SEAROBINS	0	0		
Species Group Subtotal	0	0		
SNAPPERS				
GRAY SNAPPER	653	0	0	
LANE SNAPPER	86,841	38.8	0	
OTHER SNAPPERS	323,582	22.8	33137	74.4
RED SNAPPER	6,953	74.1	0	
VERMILION SNAPPER	3,728	57.1	313	
YELLOWTAIL SNAPPER	16,790	33.8	0	
Species Group Subtotal	438,548	18.6	33450	73.7
TRIGGERFISHES/FILEFISHES				
TRIGGERFISHES/FILEFISHES	81,718	35.3	5395	
Species Group Subtotal	81,718	35.3		
TUNAS AND MACKERELS				
KING MACKEREL	48,166	37.3		
LITTLE TUNNY/ATLANTIC BONITO	17,740	60.5		
OTHER TUNAS/MACKERELS	171,350	24.5		
SPANISH MACKEREL	0	0		
Species Group Subtotal	237,257	19.8		
WRASSES				
OTHER WRASSES	3,100	32.9	518	
	3,100 3,100	32.9 32.9	518 518	

Year: 2001

Weights are for Catch Type A + B1 only								
	State Waters	State Waters						
Species	Weight (lbs)	PSE	Weight (lbs)	PSE				
BARRACUDAS								
BARRACUDAS	91,273	21.8						
Species Group Subtotal	91,273	21.8						
CARTILAGINOUS FISHES								
OTHER SHARKS	11,510	0						
SKATES/RAYS	6,431	0						

Table 3.13 Marine recreational fisheries statistics (MRFFS data) (continued)

	State Waters		EEZ		
Species	Weight (lbs)	PSE	Weight (lbs)	PSE	
Species Group Subtotal	17,941	0	5 ()		
DOLPHINS			l		
DOLPHINS	302,484	36.1			
Species Group Subtotal	302,484	36.1			
DRUMS	302, 10 1	00.1			
OTHER DRUM	5,379	44.3			
Species Group Subtotal	5,379	44.3			
EELS	3,373	77.0			
EELS	3,375	0			
Species Group Subtotal	3,375	0			
•	3,375	U			
FLOUNDERS	000	ما	<u> </u>		
OTHER FLOUNDERS	983	0			
Species Group Subtotal	983	0			
GRUNTS		20.5	ا ,		
OTHER GRUNTS	13,199	32.2	174		
PIGFISH	0	0	0		
WHITE GRUNT	7,441	33.4	185		
Species Group Subtotal	20,639	23.9	359		
HERRINGS		1	1		
HERRINGS	13,874	44.8			
Species Group Subtotal	13,874	44.8			
JACKS					
BLUE RUNNER	30,291	32.4	282		
CREVALLE JACK	155,559	45.8			
GREATER AMBERJACK	0	0			
OTHER JACKS	58,933	19.6	5516		
Species Group Subtotal	244,783	29.7	5798		
MULLETS	· · · · · · · · · · · · · · · · · · ·				
MULLETS	15,108	68.5			
Species Group Subtotal	15,108	68.5			
OTHER FISHES	10,100				
OTHER FISHES	485,894	62.3	37954		
Species Group Subtotal	485,894	62.3	0.00.		
PORGIES	100,00	02.0			
OTHER PORGIES	O	0	174		
SHEEPSHEAD	362	0	117		
Species Group Subtotal	362	0	174		
PUFFERS] 302	U_	174		
	E74	٥			
PUFFERS Species Croup Subtetal	571	0			
Species Group Subtotal SEA BASSES	571	U			
	50.077	25.0	4057		
EPINEPHELUS GROUPERS	50,077	25.2	4857		
MYCTEROPERCA GROUPERS	1,986	0			
OTHER SEA BASSES	18,109	36.5	381		
Species Group Subtotal	70,172	20.3	5238		

Table 3.13 Marine recreational fisheries statistics (MRFFS data) (continued)

	State Waters	Í	EEZ	
Species	Weight (lbs)	PSE	Weight (lbs)	PSE
SNAPPERS				
GRAY SNAPPER	483	0	0	
LANE SNAPPER	24,749	31.3	3796	
OTHER SNAPPERS	126,222	17	16757	
RED SNAPPER	0	0	0	
VERMILION SNAPPER	22,165	3.5	12635	
YELLOWTAIL SNAPPER	31,477	32.4	0	
Species Group Subtotal	205,096	12.2	33188	
TRIGGERFISHES/FILEFISHES				
TRIGGERFISHES/FILEFISHES	58,700	25.9	12236	
Species Group Subtotal	58,700	25.9	12236	
TUNAS AND MACKERELS				
KING MACKEREL	20,906	56.2		
LITTLE TUNNY/ATLANTIC BONITO	1,184	83.9		
OTHER TUNAS/MACKERELS	122,660	35.4		
SPANISH MACKEREL	2,231	0		
Species Group Subtotal	146,981	30.6		
WRASSES				
OTHER WRASSES	11,288	34.1	196	
Species Group Subtotal	11,288	34.1	196	
Grand Total	1,694,903	19.8		

Table 3.14. Categories of habitat damage by fishing gear

Rankings

- 3 High: Capable of severe damage to a wide area of habitat during a single encounter. Seriously impairs the function (for fish) of the impacted habitat.
- 2 Moderate: Capable of severe damage to habitat in a relatively limited area during a single encounter; or capable of moderate damage to habitat over a wider area. Impairs the function (for fish) of the habitat.
- 1 Minor: Capable of moderate damage to habitat in a limited area during a single encounter. May impair the function (for fish) of the habitat.
- 0 Negligible: Does not typically cause damage. No perceptible impairment to the function (for fish) of the habitat.

Table 3.15. (a) Fishing Gear Sensitivity: Index of sensitivity of habitats to fishing gears in the U.S. Caribbean

		Habitat									
Gear	Coral	Hard Bottom	Benthic	SAV	Sand-Shell	Mangrove	Soft Bottom	Wetland	Drift Algae	Rubble	Shoal-Banks
			Algae								
Trawl	3	2	2	2	2	0	2	0	0	1	1
Trap/Pot	2	2	2	2	0	0	0	0	0	0	0
Gill/Trammel Net	2	1	1	1	1	0	0	0	0	0	0
Hand Harvest	2	2	0	0	0	0	0	0	0	0	0
Beach Seine	2	2	1	1	0	0	0	0	0	0	0
Longline	1	1	0	0	0	0	0	0	0	0	0
Vertical Gear	1	1	0	0	0	0	0	0	0	0	0
Powerhead	1	1	0	0	0	0	0	0	0	0	0
Spears	1	1	0	0	0	0	0	0	0	0	0
Cast net	1	1	0	0	0	0	0	0	0	0	0
Slurp Gun	0	0	0	0	0	0	0	0	0	0	0
Dip net	0	0	0	0	0	0	0	0	0	0	0
Pelagic Longline	0	0	0	0	0	0	0	0	0	0	0
0 = None		1 = Low		2 = Modera	ate		3 = High	_			

Table 3.15. (b) Fishing Effort Index: Relative use of fishing gears on habitats in the U.S. Caribbean EEZ

		Habitat									
Gear	Coral	Hard Bottom	Benthic	SAV	Sand-Shell	Mangrove	Soft Bottom	Wetland	Drift Algae	Rubble	Shoal-Banks
			Algae								
Trawl	0	0	0	0	0	0	0	0	0	0	0
Trap/Pot	2	3	3	3	3	0	2	0	0	3	3
Gill/Trammel Net	2	2	2	3	3	0	1	0	0	3	3
Hand Harvest	2	2	2	2	2	0	2	0	0	2	2
Beach Seine	0	0	0	0	0	0	0	0	0	0	0
Longline	1	2	1	1	1	0	1	0	0	2	2
Vertical Gear	2	3	1	0	1	0	0	0	0	3	3
Powerhead	0	0	0	0	0	0	0	0	0	0	0
Spears	2	2	1	0	0	0	0	0	0	2	2
Cast net	0	0	0	0	0	0	0	0	0	0	0
Slurp Gun	1	1	0	0	0	0	0	0	0	1	1
Dip net	1	1	0	0	0	0	0	0	0	1	1
0 = None		1 = Low		2 = Modera	ate		3 = High				

Table 3.16. NOAA Fisheries review of habitat alteration projects in Puerto Rico and the US Virgin Islands, 1981-June 2002.

Acres of habitat alterations requested by type of projects reviewed in Puerto Rico and the U.S. Virgin Islands between 1981 and June 2002

			Acreage	Acreage	Acreage	Acreage
Project	: N1	N2	Proposed By	Accepted	Potentially	Mitigated
<u>Type</u>			<u>Applicants</u>	By NMFS	Conserved	
BA	49	-	-	-	-	-
BE	17	1	1.9	1.9	0.0	0.0
BR	110	7	110.7	17.1	93.6	10.6
DO	667	3	0.5	0.0	0.5	0.0
EL	3	-	-	-	-	=
НО	361	29	325.2	21.7	303.5	46.6
IN	324	35	375.0	97.1	277.8	106.5
IR	28	2	9.2	0.0	9.2	0.0
MD	246	6	32.4	18.9	13.4	0.0
MI	16	2	4.0	2.0	2.0	0.0
NA	197	29	402.8	134.1	268.7	67.2
OI	4	-	-	-	=	=
OT	118	9	130.7	25.3	105.4	0.7
PΙ	52	1	0.2	0.2	0.0	0.2
SH	457	33	168.7	30.6	138.0	134.3
TR	21	1	1.2	0.0	1.2	0.0
WR	4	-	-	-	-	-
Total	2,674	158	1,563.1	349.3	1,213.8	366.3

(BA) barriers and impoundments; (BE) beach nourishment projects; (BR) bridges,roads, and causeways; (DO) docks and other minor structures; (HO) housing developments; (IN) commercial and industrial developments; etc.; (IR) irrigation and drainage works; (MD) maintenance dredging; (MI) mining and mineral exploration; (MM) marsh management areas; (NA) navigation projects, marinas, etc.; (OI) oil and gas construction; (OT) unclassified; (PI) oil, gas, and chemical pipelines; (SH) bulkheads, small fills, groins, etc.; (TR) transmission lines; (WR) wetland restoration projects.

N1 = Total number of projects reviewed.

N2 = Number of projects where acreage was determined.

Table 3.16. Acres of habitat alterations proposed in Puerto Rico and the U.S. Virgin Islands between 1981 and June 2002 by habitat type. (continued)

Dominant	N	Acreage Proposed	Acreage Accepted	Acreage Potentially	Acreage Mitigated
Habitat		For Alteration	By NMFS	Conserved	
black mangrove	48	204.2	2.5	201.7	8.8
algae	9	20.2	14.9	5.3	0.0
fresh marsh	21	62.0	23.8	38.2	27.2
freshwater submerge	ed 1	0.0	0.0	0.0	0.0
aquatic vegetation					
shoal grass	2	4.0	0.0	4.0	0.0
Halophila	3	6.2	2.0	4.2	2.0
hardwood swamp	2	1.5	0.4	1.1	7.6
white mangrove	26	149.6	0.2	149.4	1.2
miscellaneous	10	117.6	20.9	96.7	5.2
mud substrate	14	155.4	79.5	75.9	43.2
other marsh	15	86.9	2.0	84.9	0.0
reef	2	10.5	0.0	10.5	0.0
red mangrove	50	302.4	3.7	298.7	158.2
rock substrate	4	6.5	3.8	2.7	0.0
sand substrate	49	244.6	167.1	77.5	6.5
silt substrate	2	70.1	10.5	59.6	0.0
manatee grass	5	2.6	1.6	1.0	1.7
turtle grass	24	118.8	16.4	102.4	104.7
Total	287	1,563.1	349.3	1,213.8	366.3

Table is based on a sample of 158 projects.

Table 3.17. Number of projects reviewed yearly by the NOAA Fisheries Southeast Region, 1982 through 2001

CALENDAR YEAR	<u>U.S.</u> <u>VIRGIN ISLANDS</u>	PUERTO RICO	TOTAL
1982	12	60	72
1983	8	44	52
1984	4	73	77
1985	30	60	90
1986	11	119	130
1987	16	123	139
1988	15	233	248
1989	13	228	241
1990	6	127	133
1991	31	92	123
1992	14	80	94
1993	12	78	90
1994	13	80	93
1995	12	76	88
1996	9	113	122
1997	38	216	254
1998	17	113	130
1999	33	126	159
2000	27	91	118
2001	10	105	115

Table 3.18 Summary of concerns about natural and anthropogenic pressures on coral reef ecosystems in the US Caribbean based on priorities of reef managers

	Puerto Rico	U.S. Virgin Islands
Global warming and bleaching	М	M
Diseases	Н	Н
Tropical storms	L	Н
Coastal development and runoff	Н	Н
Coastal pollution	Н	Н
Tourism and recreation	M	M
Trade in coral and live reef species	Н	L
Ships, boats, and groundings	M	Н
Marine debris	M	L
Alien species	L	L
Other physical impacts	Н	L
Offshore oil and gas exploration	L	L

H = High concern; M = Medium concern; L = Little to no concern Based on Turgeon et al. (2002)

Table 4.1 Fishing threat analysis for Caribbean fish habitats

FMP Reef	Gear	Habitat	Fishing Gear Sensitivity	Fishing Effort	Fishing Impacts index	Habitat use score	Relative Risk
Fish	Pot/trap	Marine Reef	2	2	4	4	16
	•	Marine Hard Bot	2	3	6	4	24
		Marine Sand/sh	0	3	0	4	0
		Marine Pelagic	0	0	0	3	0
		Marine Seagr	2	3	6	4	24
		Estuar Seagr	2	1	2	3	6
		Estuar Mangr	0	0	0	2	0
		Marine Mangr	0	0	0	3	0
		Marine Rubble	0	3	0	3	0
		Marine Shoals	0	3	0	2	0
		Marine Soft Bot	0	2	0	2	0
		Estuar Wetlands	0	0	0	1	0
		Estuar Sand/Sh	0	1	0	1	0
		Estuar Soft Bot	0	1	0	1	0
		Marine Ben Alg	2	3	6	2	12
		Marine Drift Alg	0	0	0	1	0
	Longline	Marine Reef	1	1	1	4	4
		Marine Hard Bot	1	2	2	4	8
		Marine Sand/sh	0	1	0	4	0
		Marine Pelagic	0	0	0	3	0
		Marine Seagr	0	1	0	4	0
		Estuar Seagr	0	0	0	3	0
		Estuar Mangr	0	0	0	2	0
		Marine Mangr	0	0	0	3	0
		Marine Rubble	0	2	0	3	0
		Marine Shoals	0	2	0	2	0
		Marine Soft Bot	0	1	0	2	0

Table 4.1 Fishing threat analysis for Caribbean fish habitats Continued

FMP Reef	Gear	Habitat	Fishing Gear Sensitivity	Fishing Effort	Fishing Impacts index	Habitat use score	Relative Risk
Fish	Longline	Estuar Wetlands	0	0	0	1	0
	C	Estuar Sand/Sh	0	0	0	1	0
		Estuar Soft Bot	0	0	0	1	0
		Marine Ben Alg	0	1	0	2	0
		Marine Drift Alg	0	0	0	1	0
	Vertical						
	Gear	Marine Reef	1	2	2	4	8
		Marine Hard Bot	1	3	3	4	12
		Marine Sand/sh	0	1	0	4	0
		Marine Pelagic	0	0	0	3	0
		Marine Seagr	0	0	0	4	0
		Estuar Seagr	0	0	0	3	0
		Estuar Mangr	0	0	0	2	0
		Marine Mangr	0	0	0	3	0
		Marine Rubble	0	3	0	3	0
		Marine Shoals	0	3	0	2	0
		Marine Soft Bot	0	0	0	2	0
		Estuar Wetlands	0	0	0	1	0
		Estuar Sand/Sh	0	0	0	1	0
		Estuar Soft Bot	0	0	0	1	0
		Marine Ben Alg	0	2	0	2	0
		Marine Drift Alg	0	0	0	1	0
	Beach						
	seine	Marine Seagr	1	0	0	4	0
		Estuar Seagr	1	0	0	3	0
		Marine Ben Alg	1	0	0	2	0
	Gill / Trammel						
	net	Marine Reef	2	2	4	4	<mark>16</mark>
	1101	Marine Hard Bot	1	2	2	4	8
		Marine Sand/sh	1	3	3	4	12
		Marine Pelagic	0	0	0	3	0

Table 4.1 Fishing threat analysis for Caribbean fish habitats Continued

			Fishing Gear	Fishing	Fishing	Habitat use	
FMP	Gear	Habitat	Sensitivity	Effort	Impacts index	score	Relative Risk
		Marine Seagr	1	3	3	4	12
		Estuar Seagr	1	0	0	3	0
		Estuar Mangr	0	0	0	2	0
		Marine Mangr	0	0	0	3	0
		Marine Rubble	0	3	0	3	0
		Marine Shoals	0	2	0	2	0
		Marine Soft Bot	0	1	0	2	0
		Estuar Wetlands	0	0	0	1	0
		Estuar Sand/Sh	1	0	0	1	0
		Estuar Soft Bot	0	0	0	1	0
		Marine Ben Alg	1	2	2	2	4
		Marine Drift Alg	0	0	0	1	0
	Spear	Marine Reef	1	2	2	4	8
		Marine Hard Bot	1	2	2	4	8
		Marine Sand/sh	0	0	0	4	0
		Marine Pelagic	0	0	0	3	0
		Marine Seagr	0	0	0	4	0
		Estuar Seagr	0	0	0	3	0
		Estuar Mangr	0	0	0	2	0
		Marine Mangr	0	0	0	3	0
		Marine Rubble	0	2	0	3	0
		Marine Shoals	0	2	0	2	0
		Marine Soft Bot	0	0	0	2	0
		Estuar Wetlands	0	0	0	1	0
		Estuar Sand/Sh	0	0	0	1	0
		Estuar Soft Bot	0	0	0	1	0
		Marine Ben Alg	0	1	0	2	0
		Marine Drift Alg	0	0	0	1	0
Queen	Hand						
Conch	harvest	Marine Seagr	0	2	0	4	0
		Marine Sand/Sh	0	2	0	4	0
		Marine Ben Alg	0	2	0	3	0

Table 4.1 Fishing threat analysis for Caribbean fish habitats Continued

FMP	Gear	Habitat	Fishing Gear Sensitivity	Fishing Effort	Fishing Impacts index	Habitat use score	Relative Risk
- 1.11		Marine Hard bot	0	2	0	3	0
		Marine Reef	0	2	0	2	0
		Estuar Seagr	0	1	0	2	0
		Marine Pelagic	0	0	0	1	0
		Marine Rubble	0	2	0	1	0
Spiny							
	Pot/Trap	Marine Reef	2	2	4	4	16
		Marine Seagr	2	3	6	4	24
		Estuar Seagr	2	1	2	3	6
		Marine Hard bot	2	3	6	3	18
		Marine Ben Alg	2	3	6	2	12
		Marine Pelagic	0	0	0	2	0
		Estuar Ben Alg	2	2	4	1	4
		Estuar Mangr	0	0	0	1	0
		Marine Mangr	0	0	0	1	0
	Gill /	_					
	Tramme						
	net	Marine Reef	2	2	4	4	<mark>16</mark>
		Marine Seagr	1	3	3	4	12
		Estuar Seagr	1	1	1	3	3
		Marine Hard bot	1	2	2	3	6
		Marine Ben Alg	1	1	1	2	2
		Marine Pelagic	0	0	0	2	0
		Estuar Ben Alg	1	2	2	1	2
		Estuar Mangr	0	0	0	1	0
		Marine Mangr	0	0	0	1	0
Coral	Hand	Marine Reef	2	1	2	4	8
		Marine Hard bot	2	1	2	4	8

Table 4.2. Ranking of gear impacts on habitats of the US Caribbean

			Fishing	Fishing		Highest	
Habitat	FMP	Gear	Threat	Effort	Impact	Ecol Impt	Rel Risk
Marine Seagr	Reef Fish, S Lobster, Q Conch	•	2	3	6	4	24
Marine Hard Bot	Reef Fish, Coral	Pots/traps	2	3	6	4	24
Marine Ben Alg	Q Conch	Pots/traps	2	3	6	3	18
Marine Reef	Reef Fish, S Lobster, Coral	Pots/traps	2	2	4	4	16
Marine Reef	Reef Fish, S Lobster, Coral	Gill/Tram	2	2	4	4	16
Marine Seagr	Reef Fish, S Lobster, Q Conch	Gill/Tram	1	3	3	4	12
Marine Hard Bot	Reef Fish, Coral	Vert gear	1	3	3	4	12
Marine Sand/sh	Reef Fish, Q conch	Gill/Tram	1	3	3	4	12
Estuar Seagr	S Lobster	Pots/traps	2	1	2	4	8
Marine Hard Bot	Reef Fish, Coral	Gill/Tram	1	2	2	4	8
Marine Hard Bot	Reef Fish, Coral	Longline	1	2	2	4	8
Marine Hard Bot	Reef Fish, Coral	Spear	1	2	2	4	8
Marine Reef	Reef Fish, S Lobster, Coral	Spear	1	2	2	4	8
Marine Reef	Reef Fish, S Lobster, Coral	Vert gear	1	2	2	4	8
Estuar Ben Alg	S lobster	Pots/traps	2	2	4	2	8
Marine Hard Bot	Reef Fish, Coral	Hand	2	1	2	4	8
Marine Ben Alg	Lobster, Q Conch	Gill/Tram	1	2	2	3	6
Marine Reef	Reef Fish, S Lobster, Coral	Longline	1	1	1	4	4
Estuar Ben Alg	S lobster	Gill/Tram	1	2	2	2	4
Marine Sand/sh	Reef Fish, Q conch	Longline	0	1	0	4	0
Marine Ben Alg	Lobster, Q Conch	Longline	0	1	0	3	0
Marine Pelagic	Reef Fish	Gill/Tram	0	0	0	3	0
Marine Pelagic	Reef Fish	Hand	0	0	0	3	0
Marine Pelagic	Reef Fish	Longline	0	0	0	3	0
Marine Pelagic	Reef Fish	Pots/traps	0	0	0	3	0
Marine Pelagic	Reef Fish	Spear	0	0	0	3	0
Marine Pelagic	Reef Fish	Vert gear	0	0	0	3	0
Marine Reef	Reef Fish, S Lobster, Coral	Hand	0	2	0	4	0
Marine Sand/sh	Reef Fish, Q conch	Hand	0	2	0	4	0
Marine Sand/sh	Reef Fish, Q conch	Pots/traps	0	3	0	4	0
Marine Sand/sh	Reef Fish, Q conch	Spear	0	0	0	4	0

Table 4.2. Ranking of gear impacts on habitats of the US Caribbean Continued

			Fishing	Fishing		Highest	
Habitat	FMP	Gear	Threat	Effort	Impact	Ecol Impt	Rel Risk
Marine Sand/sh	Reef Fish, Q conch	Vert gear	0	1	0	4	0
Marine Seagr	Reef Fish, S Lobster, Coral	Hand	0	2	0	4	0
Marine Seagr	Reef Fish, S Lobster, Coral	Longline	0	1	0	4	0
Marine Seagr	Reef Fish, S Lobster, Coral	Spear	0	0	0	4	0
Marine Seagr	Reef Fish, S Lobster, Coral	Vert gear	0	0	0	4	0
Estuar Mangr	Reef Fish	Gill/Tram	0	0	0	2	0
Estuar Mangr	Reef Fish	Longline	0	0	0	2	0
Estuar Mangr	Reef Fish	Pots/traps	0	0	0	2	0
Estuar Mangr	Reef Fish	Spear	0	0	0	2	0
Estuar Mangr	Reef Fish	Vert gear	0	0	0	2	0
Estuar Seagr	Lobster	Gill/Tram	1	0	0	4	0
Estuar Seagr	Lobster	Hand	0	1	0	4	0
Estuar Seagr	Lobster	Longline	0	0	0	4	0
Estuar Seagr	Lobster	Spear	0	0	0	4	0
Estuar Seagr	Lobster	Vert gear	0	0	0	4	0
Marine Ben Alg	Lobster, Q Conch	Hand	0	2	0	3	0
Marine Ben Alg	Lobster, Q Conch	Spear	0	1	0	3	0
Marine Ben Alg	Lobster, Q Conch	Vert gear	0	2	0	3	0
Marine Mangr	Reef Fish	Gill/Tram	0	0	0	3	0
Marine Mangr	Reef Fish	Hand	0	0	0	3	0
Marine Mangr	Reef Fish	Longline	0	0	0	3	0
Marine Mangr	Reef Fish	Pots/traps	0	0	0	3	0
Marine Mangr	Reef Fish	Spear	0	0	0	3	0
Marine Mangr	Reef Fish	Vert gear	0	0	0	3	0
Estuar Wetlands	Reef Fish	Gill/Tram	0	0	0	1	0
Estuar Wetlands	Reef Fish	Longline	0	0	0	1	0
Estuar Wetlands	Reef Fish	Pots/traps	0	0	0	1	0
Estuar Wetlands	Reef Fish	Spear	0	0	0	1	0
Estuar Wetlands	Reef Fish	Vert gear	0	0	0	1	0
Marine Rubble	Reef Fish	Gill/Tram	0	3	0	3	0
Marine Rubble	Reef Fish	Longline	0	2	0	3	0
Marine Rubble	Reef Fish	Pots/traps	0	3	0	3	0

Table 4.2. Ranking of gear impacts on habitats of the US Caribbean Continued

				Fishing	Fishing		Highest	
Habitat		FMP	Gear	Threat	Effort	Impact	Ecol Impt	Rel Risk
Marine Rubble	Reef Fish		Spear	0	2	0	3	0
Marine Rubble	Reef Fish		Vert gear	0	3	0	3	0
Marine Shoals	Reef Fish		Gill/Tram	0	2	0	2	0
Marine Shoals	Reef Fish		Longline	0	2	0	2	0
Marine Shoals	Reef Fish		Pots/traps	0	3	0	2	0
Marine Shoals	Reef Fish		Spear	0	2	0	2	0
Marine Shoals	Reef Fish		Vert gear	0	3	0	2	0
Marine Soft Bot	Reef Fish		Gill/Tram	0	1	0	2	0
Marine Soft Bot	Reef Fish		Longline	0	1	0	2	0
Marine Soft Bot	Reef Fish		Pots/traps	0	2	0	2	0
Marine Soft Bot	Reef Fish		Spear	0	0	0	2	0
Marine Soft Bot	Reef Fish		Vert gear	0	0	0	2	0
Estuar Ben Alg	S lobster		Hand	0	1	0	2	0
Estuar Ben Alg	S lobster		Longline	0	0	0	2	0
Estuar Ben Alg	S lobster		Spear	0	0	0	2	0
Estuar Ben Alg	S lobster		Vert gear	0	0	0	2	0
Estuar Sand/Sh	Reef Fish		Gill/Tram	1	0	0	1	0
Estuar Sand/Sh	Reef Fish		Longline	0	0	0	1	0
Estuar Sand/Sh	Reef Fish		Pots/traps	0	1	0	1	0
Estuar Sand/Sh	Reef Fish		Spear	0	0	0	1	0
Estuar Sand/Sh	Reef Fish		Vert gear	0	0	0	1	0
Estuar Soft Bot	Reef Fish		Gill/Tram	0	0	0	1	0
Estuar Soft Bot	Reef Fish		Longline	0	0	0	1	0
Estuar Soft Bot	Reef Fish		Pots/traps	0	1	0	1	0
Estuar Soft Bot	Reef Fish		Spear	0	0	0	1	0
Estuar Soft Bot	Reef Fish		Vert gear	0	0	0	1	0
Marine Drift Alg	Reef Fish		Gill/Tram	0	0	0	1	0
Marine Drift Alg	Reef Fish		Longline	0	0	0	1	0
Marine Drift Alg	Reef Fish		Pots/traps	0	0	0	1	0
Marine Drift Alg	Reef Fish		Spear	0	0	0	1	0
Marine Drift Alg	Reef Fish		Vert gear	0	0	0	1	0

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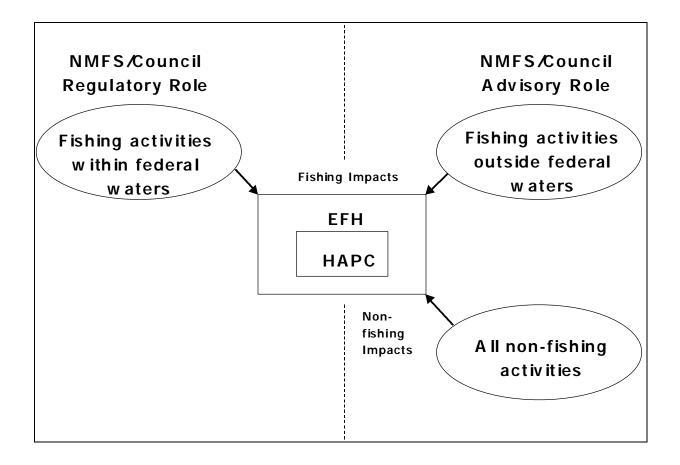


Figure 2.1. The regulatory and advisory roles of the Caribbean Council and NMFS related to essential fish habitat.

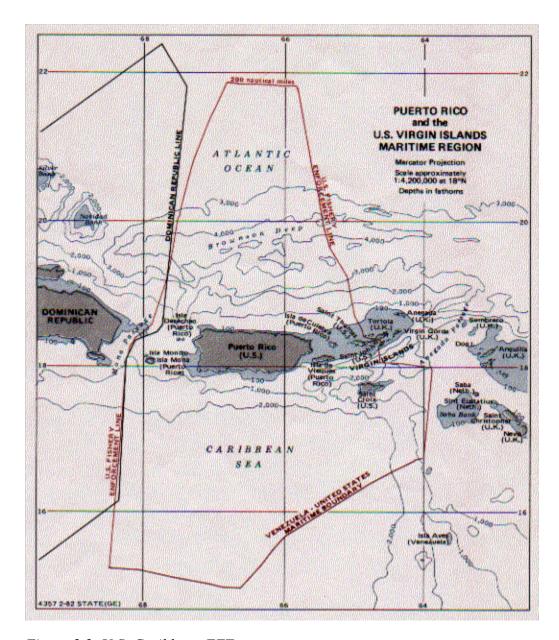


Figure 2.2. U.S. Caribbean EEZ

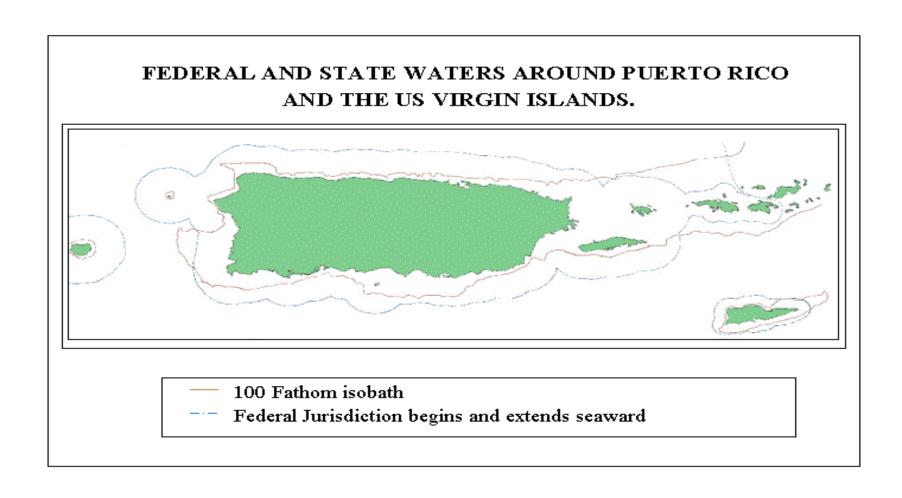


Figure 2.3. Federal and State waters around Puerto Rico and the U.S. Virgin Island

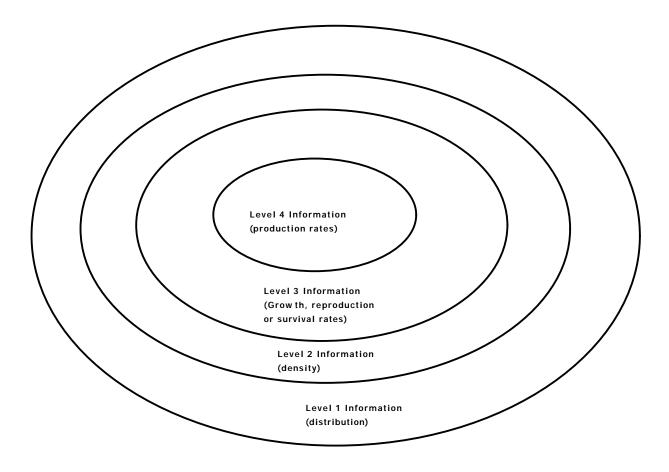


Figure 2.4. Diagrammatic relationship between the level of information and the extent of EFH

Habitat Mapping Index Puerto Rico and the U.S. Virgin Islands

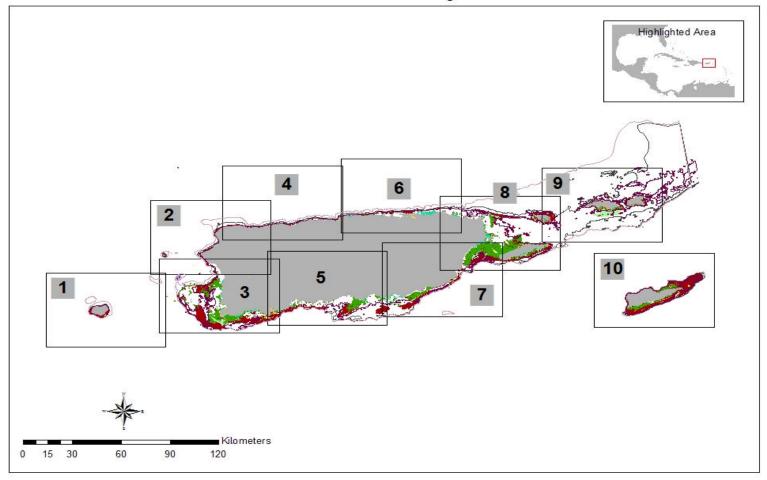


Figure 2.5. Index to habitat distribution mosaic maps (from Kendall et al. 2001)



Figure~2.6.~Mosaic~map~No.1~for~habitat~distribution~on~Mona~Island~(from~Kendall~et~al.~2001)

0 2.5 5

Kilometers

20

15

Habitat (Map 2) Puerto Rico and the U.S. Virgin Islands

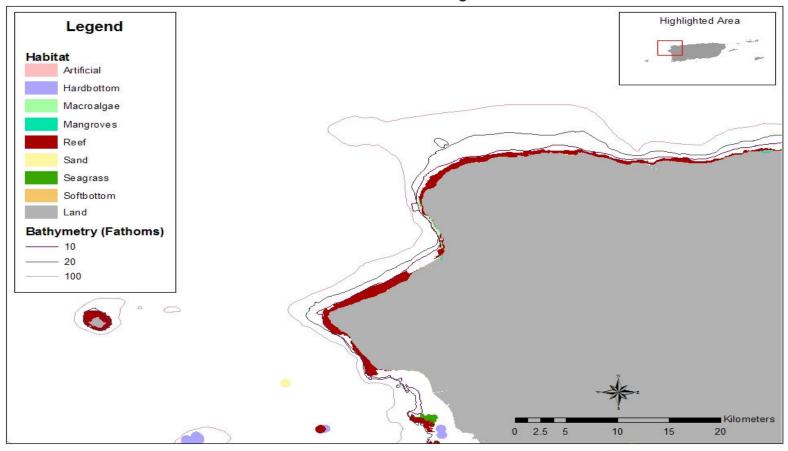


Figure 2.7. Mosaic map No. 2 for habitat distribution in the northwest of Puerto Rico (from Kendall et al. 2001). Colored circles are habitats derived from SEAMAP surveys, which may not accurately portray habitat.

Habitat (Map 3) Puerto Rico and the U.S. Virgin Islands

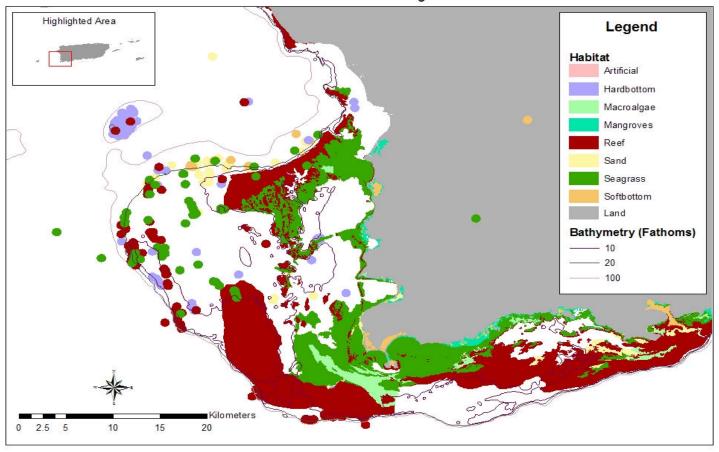


Figure 2.8. Mosaic Map No. 3 for habitat distribution in the southwest of Puerto Rico (from Kendall et al. 2001). Colored circles are habitats derived from SEAMAP surveys, which may not accurately portray habitat.

Habitat (Map 4) Puerto Rico and the U.S. Virgin Islands

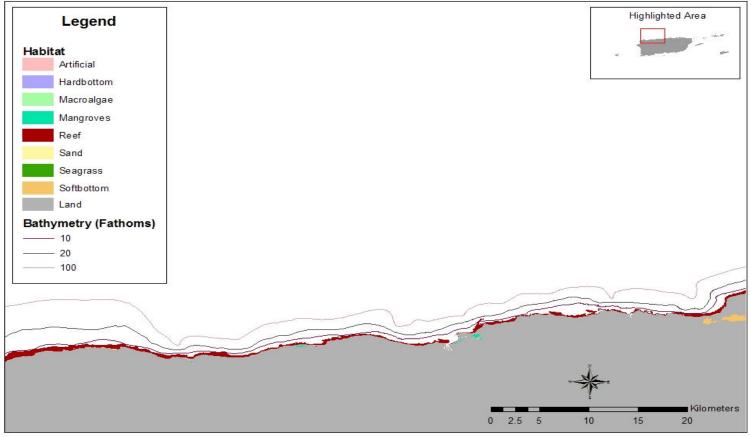


Figure 2.9. Mosaic map No. 4 for habitat distribution in the western region of the north shore of Puerto Rico (from Kendall et al. 2001)

Habitat (Map 5) Puerto Rico and the U.S. Virgin Islands

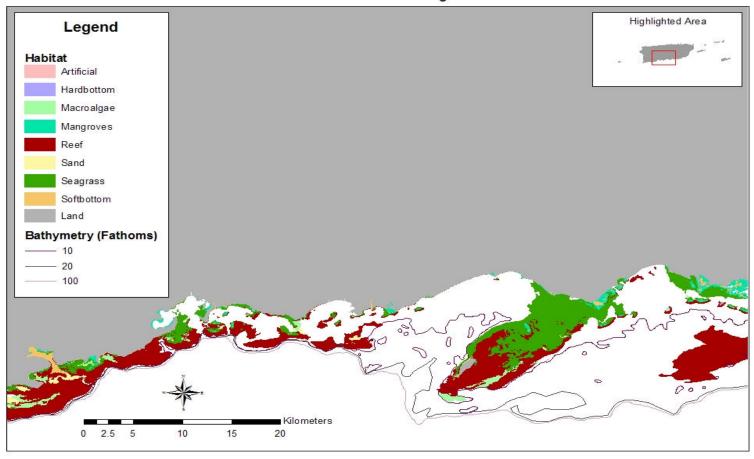


Figure 2.10. Mosaic map No. 5 for habitat distribution for the central region of the south coast of Puerto Rico (from Kendall et al. 2001)

Puerto Rico and the U.S. Virgin Islands Highlighted Area Legend Habitat Artificial Hardbottom Macroalgae Mangroves Reef Sand Seagrass Softbottom Land Bathymetry (Fathoms) 20 100

Habitat (Map 6)

Figure 2.11. Mosaic map No. 6 for habitat distribution for the eastern region of the north coast of Puerto Rico (from Kendall et al. 2001)

0 2.5 5

10

15

Kilometers

20

Habitat (Map 7) Puerto Rico and the U.S. Virgin Islands

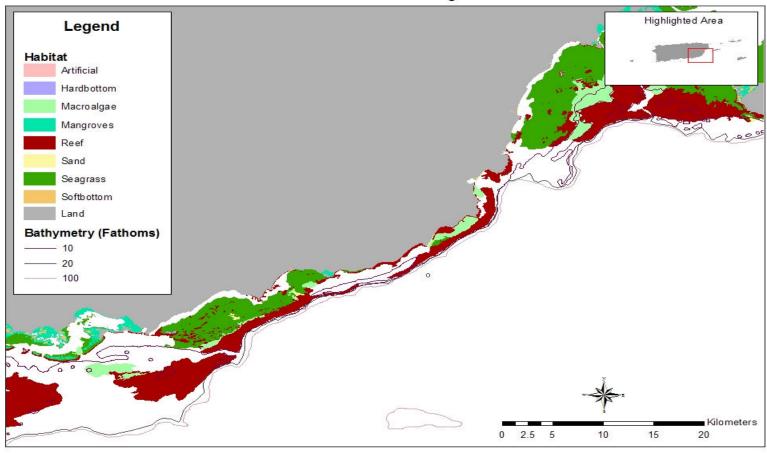


Figure 2.12. Mosaic map No.7 for habitat distribution for the eastern region of the south coast of Puerto Rico (from Kendall et al. 2001)

Habitat (Map 8) Puerto Rico and the U.S. Virgin Islands

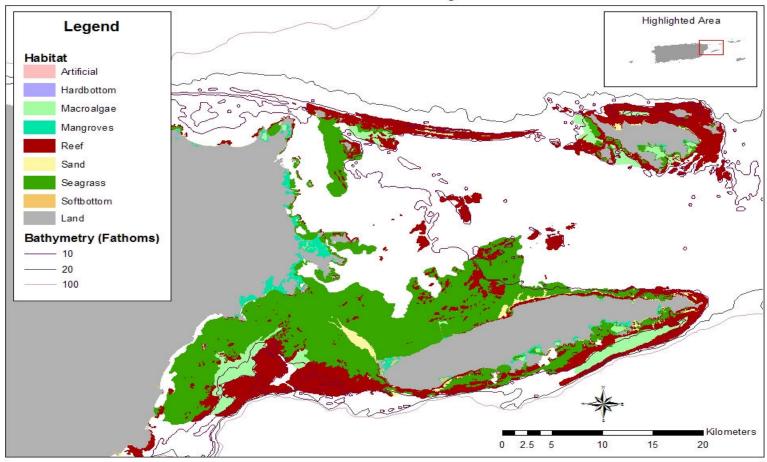


Figure 2.13. Mosaic map No.8 for habitat distribution for east coast of Puerto Rico (from Kendall et al. 2001)

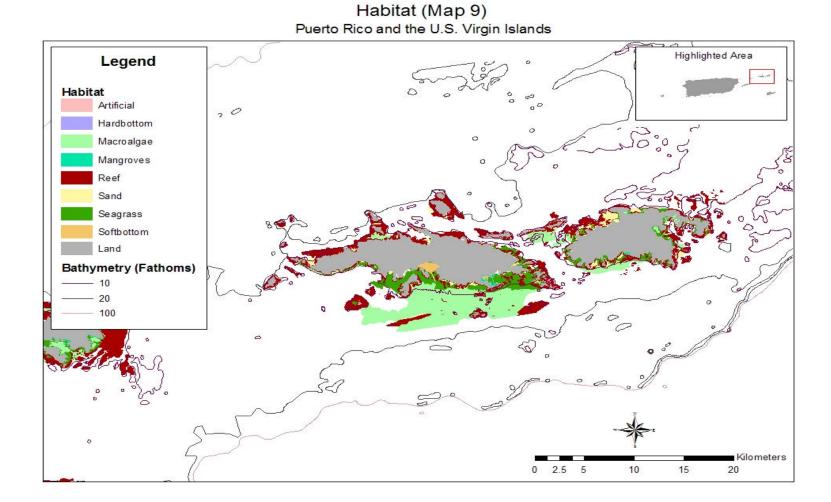


Figure 2.14. Mosaic map No. 9 for habitat distribution in St. Thomas and St. John (from Kendall et al. 2001)

Habitat (Map 10) Puerto Rico and the U.S. Virgin Islands

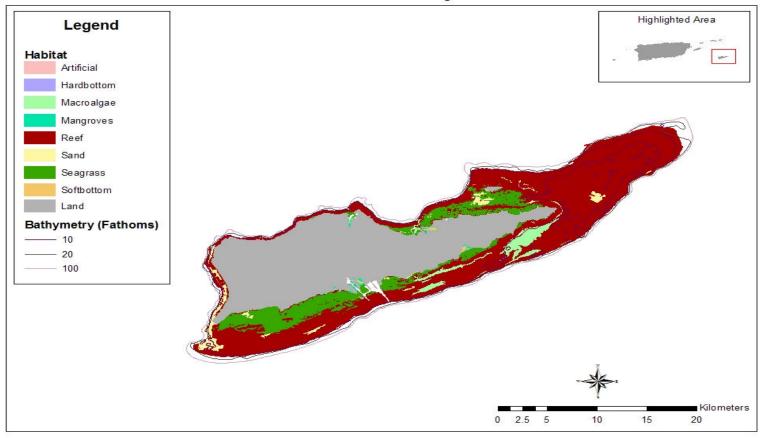


Figure 2.15. Mosaic map No. 10 for habitat distribution on St. Croix (from Kendall et al. 2001)

Reefs Legend Sampled Sites Surveyed Reef Data Known Habitat Potential Habitat Land State Boundaries Exclusive Economic Zone (EEZ) Virgin Islands Puerto Rico 0 10 20

Known and Potential Habitat

Figure 2.16. Known (from Kendall et al. 2001) and potential coral reef habitat for Puerto Rico and the US Virgin Islands.

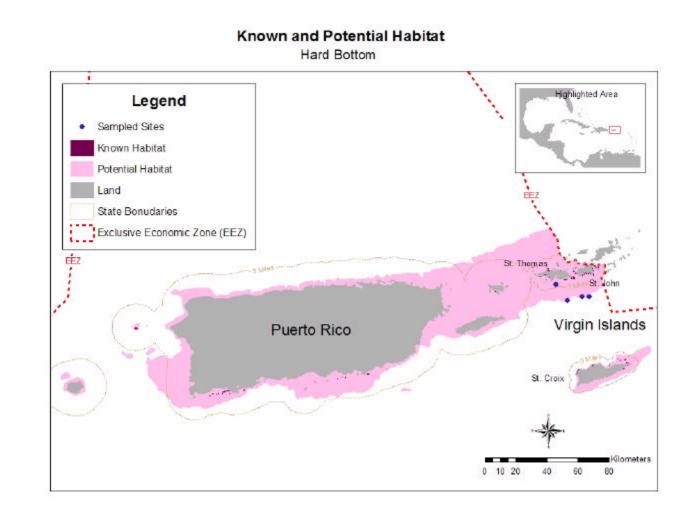


Figure 2.17. Known (from Kendall et al. 2001) and potential hard bottom habitat for Puerto Rico and the US Virgin Islands.

Legend Known Habitat Potential Habitat Land State Boundaries Exclusive Economic Zone (EEZ) Puerto Rico Highlighted Area Highlighted Area Virgin Islands

Known and Potential Habitat

Figure 2.18. Known (from Kendall et al. 2001) and potential soft bottom habitat for Puerto Rico and the US Virgin Islands.

St. Croix

0 10 20

Seagrass Legend Surveyed Seagrass Data Known Habitat Potential Habitat State Boundaries Exclusive Economic Zone (EEZ) St. Thomas Virgin Islands Puerto Rico St. Croix 0 10 20

Known and Potential Habitat

Figure 2.19. Known (from Kendall et al. 2001) and potential seagrass habitat for Puerto Rico and the US Virgin Islands.

Known and Potential Habitat Macroalgae Legend Known Habitat Potential Habitat State Boundaries Exclusive Economic Zone (EEZ) Virgin Islands Puerto Rico

Figure 2.20. Known (from Kendall et al. 2001) and potential benthic algae habitat for Puerto Rico and the US Virgin Islands.

Sand Legend Known Habitat Potential Habitat State Boundaries Exclusive Economic Zone (EEZ) Virgin Islands Puerto Rico

Known and Potential Habitat

Figure 2.21. Known (from Kendall et al. 2001) and potential sand-shell habitat for Puerto Rico and the US Virgin Islands.

14.92% Beyond State Boundaries Legend Potential Habitat (Within State Boundaries) 767522.8347 hectares Potential Habitat (Outside State Boundaries) 114483.9709 hectares State Boundaries Exclusive Economic Zone (EEZ) Land St. Thomas Puerto Rico 12.31% 2.61%

Potential Habitat (Areas Less Than 100 Fathoms)

Figure 2.22. Distribution of the US insular shelf in the EEZ and state waters for Puerto Rico and USVI

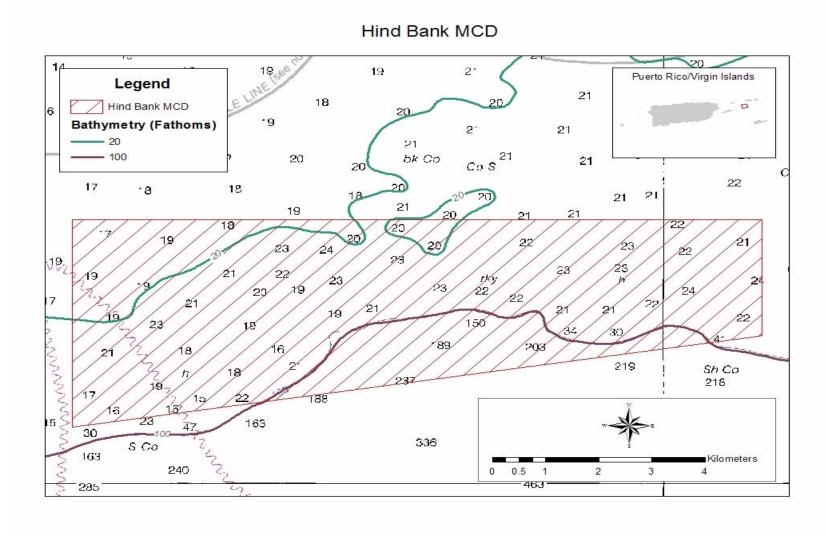


Figure 2.23. Area and bathymetry of the Hind Bank Marine Conservation District.

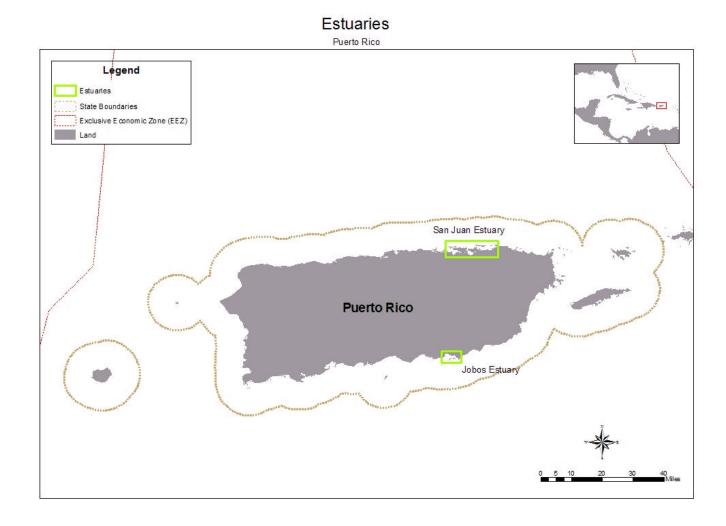


Figure 2.24. Estuaries around Puerto Rico

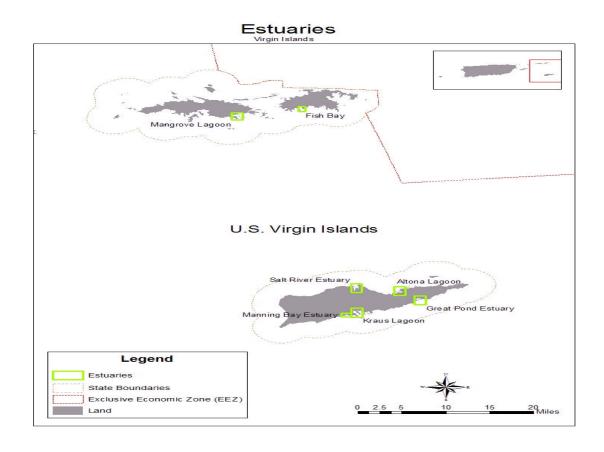


Figure 2.25. Estuaries around the U.S. Virgin Islands

Managed Areas: Area Closures

Puerto Rico and the U.S. Virgin Islands

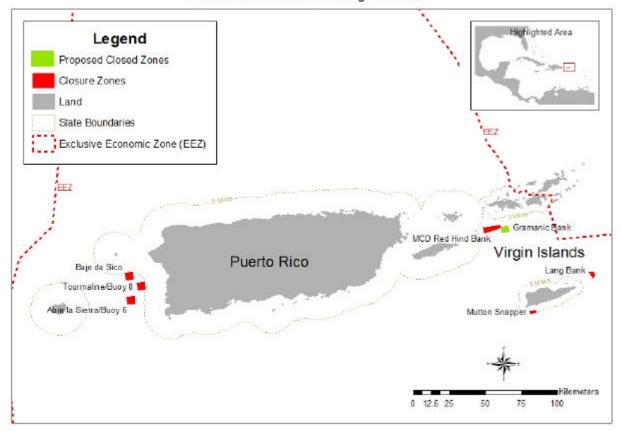


Figure 2.26. Seasonal and permanent spawning ground closures by the Caribbean Fishery Management Council.

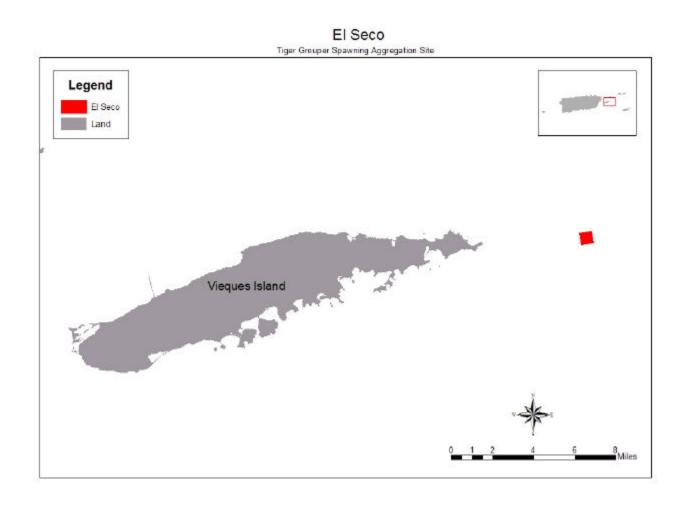


Figure 2.27. Tiger grouper spawning area (El Seco) at Vieques

Potential Red Hind Spawning Aggregation

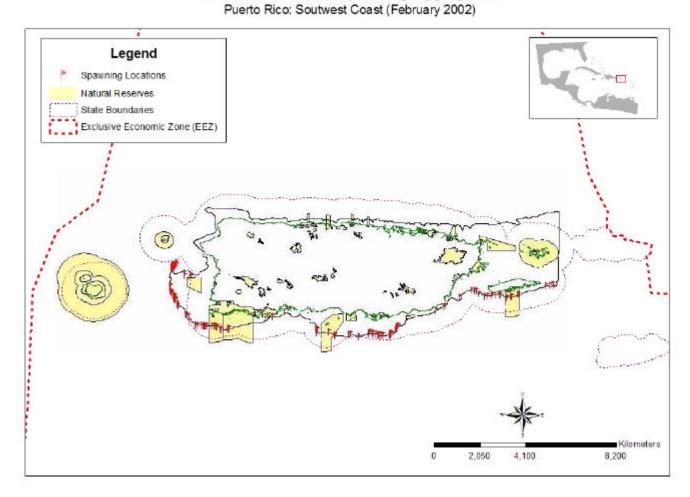


Figure 2.28. Potential new red hind spawning areas from southern Puerto Rico (Jose Rivera, personal communication)

Puerto Rico: Southwest Coastline Legend ▲ All Species: Running Ripe Closure Zones Bajo de Sico Abrir la Sierra / Buoy 6 Tourmaline / Buoy 8 State Boundaries Land

Aggregated Running Ripe Sites

Figure 2.29. Locations of running ripe reef fish from SEAMAP surveys

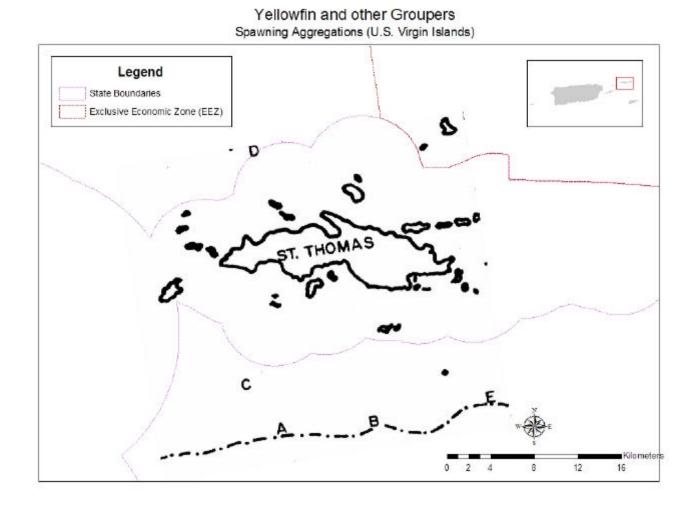


Figure 2.30. Yellowfin grouper spawning areas (Sites A-E) (from Olsen and LaPlace)

Puerto Rico

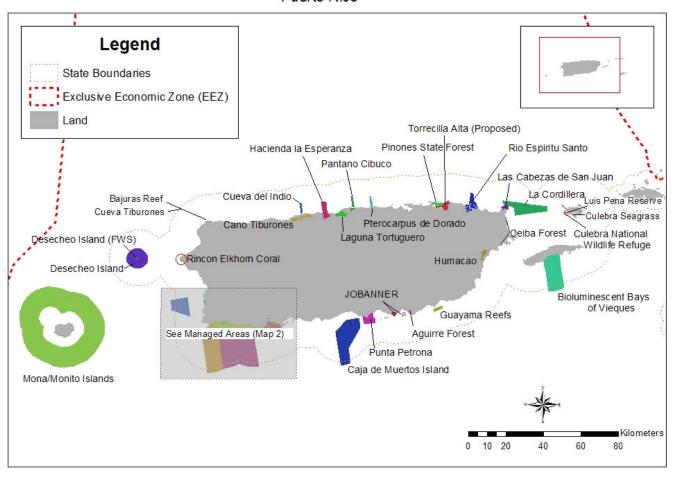


Figure 2.31. Managed areas around Puerto Rico

Managed Areas (Map 2)

Puerto Rico

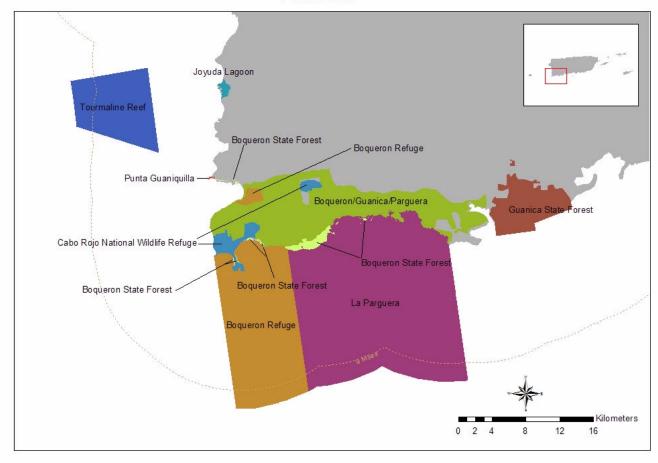


Figure 2.32. Managed areas around southwest Puerto Rico

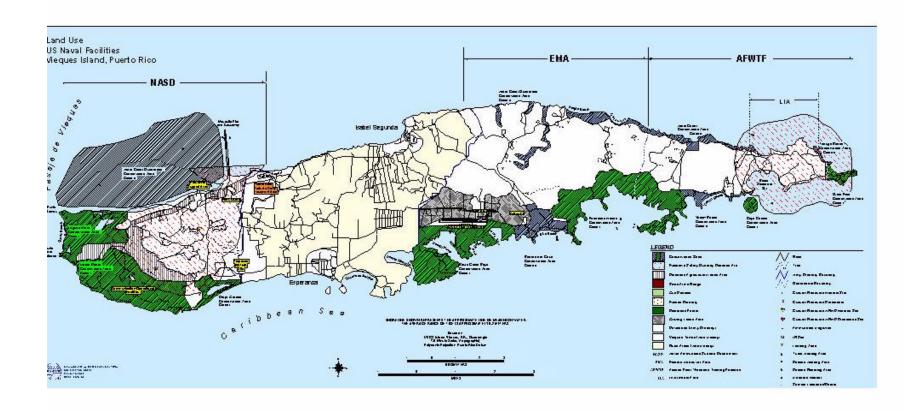


Figure 2.33. Habitat areas around Vieques Island (from US Navy Land Use Management Plan). The seagrass areas west of Mosquito Pier are proposed for HAPC

U.S. Virgin Islands: St. Thomas

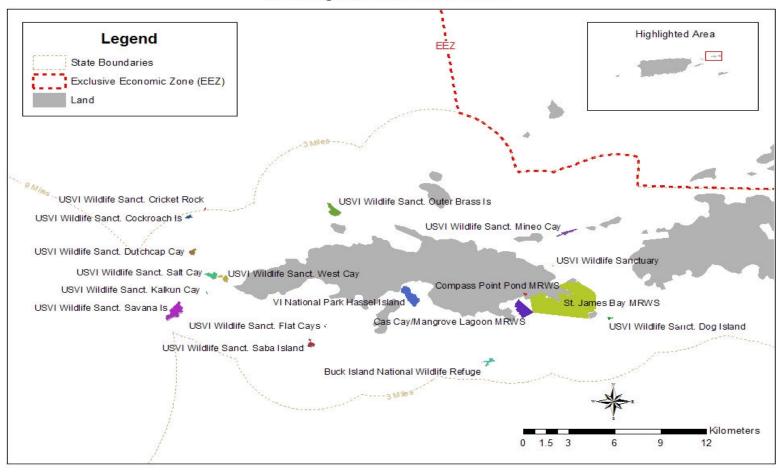


Figure 2.34. Managed areas around St. Thomas

U.S. Virgin Islands: St. John

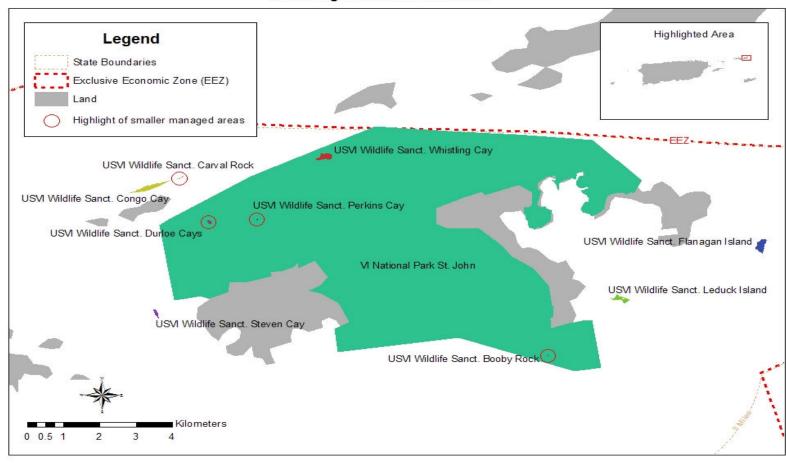


Figure 2.35. Managed areas around St. John

U.S. Virgin Islands: St. Croix

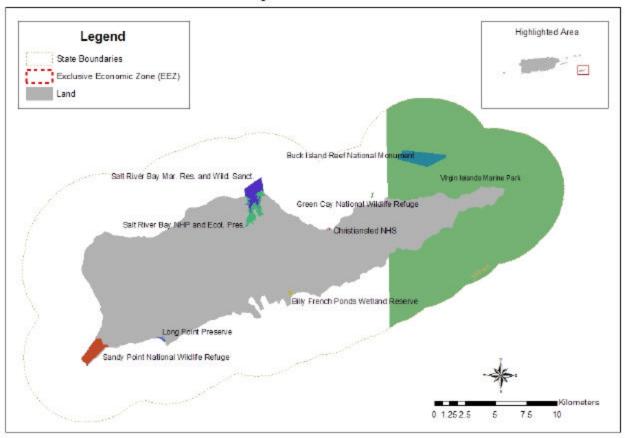


Figure 2.36. Managed areas around St. Croix

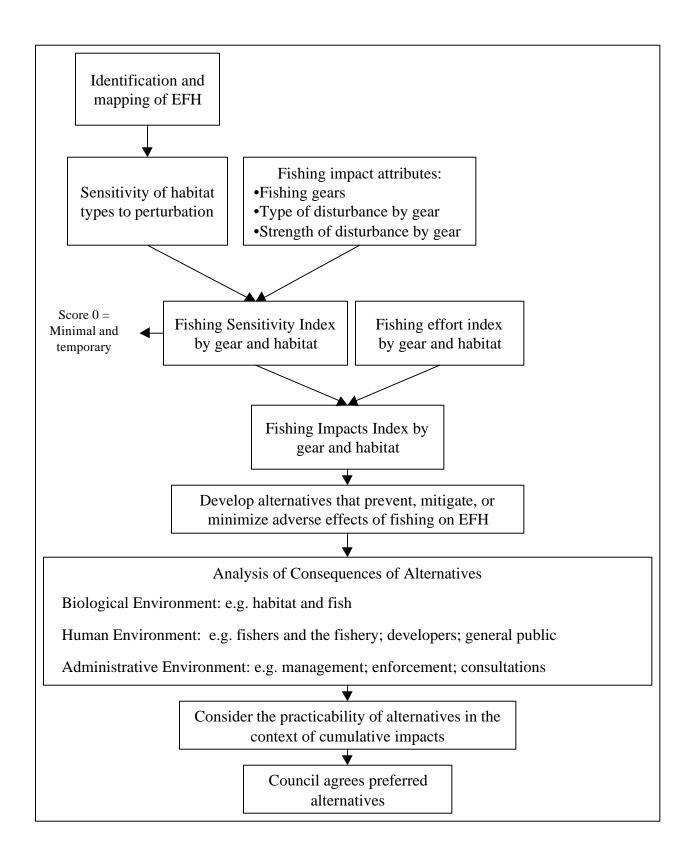


Figure 2.37. Flow diagram to demonstrate the formulation and analysis of alternatives for preventing, mitigating, or minimizing the adverse effects of fishing.

EFH in the US Caribbean

Puerto Rico and the U.S. Virgin Islands

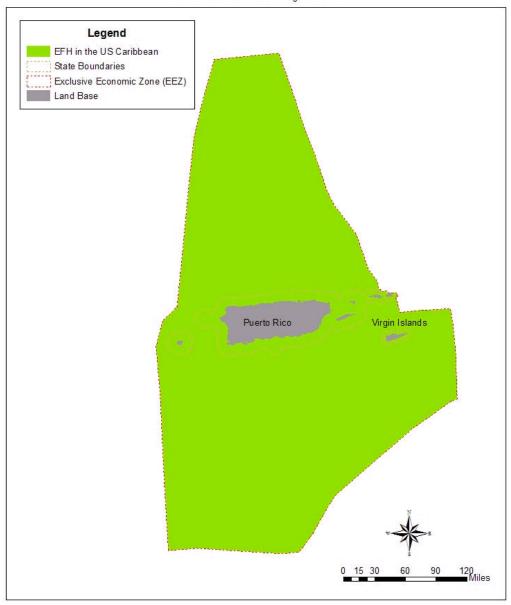


Figure 2.38. Composite EFH for species and life stages of the Spiny Lobster, Queen Conch, Reef Fish, and Coral FMPs under alternatives of Concept 2 and 6.

Legend Non egg and larval EPH Non-EPH habitat Slate Boundaries Exclusive Economic Zone (EEZ) Land Puerto Rico St. Thomas St. John

Non egg and larval component of Spiny Lobster EFH

Figure 2.39. EFH designation for Spiny Lobster under Spiny Lobster Alternative 6.

Legend Non egg and larval EPH Non-EPH Habitat State Boundaries Exclusive Economic Zone (EEZ) Land Puerto Rico St. Thomas St. John

Non egg and larval component of Queen Conch EFH

Figure~2.40.~EFH~designation~for~Queen~Conch~under~the~Queen~Conch~Alternative~6.

Legend Non egg and larval EPH Non-EPH habitat State Boundaries Exclusive Economic Zone (EEZ) Land Puerto Rico St. Thomas St. John St. Croix

Non egg and larval component of Reeffish EFH

Figure~2.41.~EFH~designation~for~Reef~Fish~under~Reef~Fish~Alternative~6.

Legend Non-egg and larval EFH Non-EFH habitat State Boundaries Exclusive Economic Zone (EEZ) Land Puerto Rico St. Thomas St. John Puerto Rico

Non egg and larval component of Coral EFH

Figure 2.42. EFH designation for Coral under Coral Alternative 6.

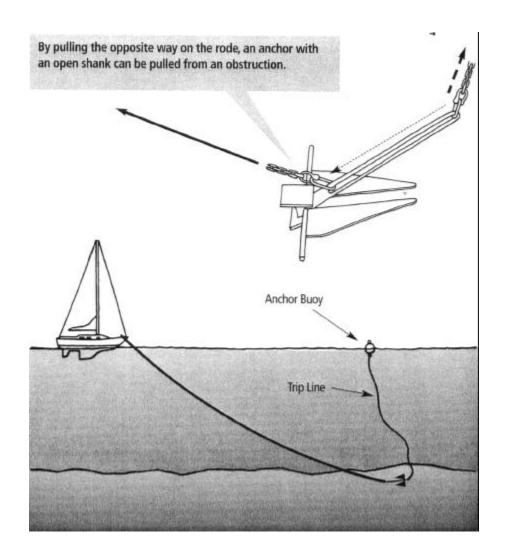


Figure 2.43. Trip line anchor retrieval system (from Rousmaniere 1999)

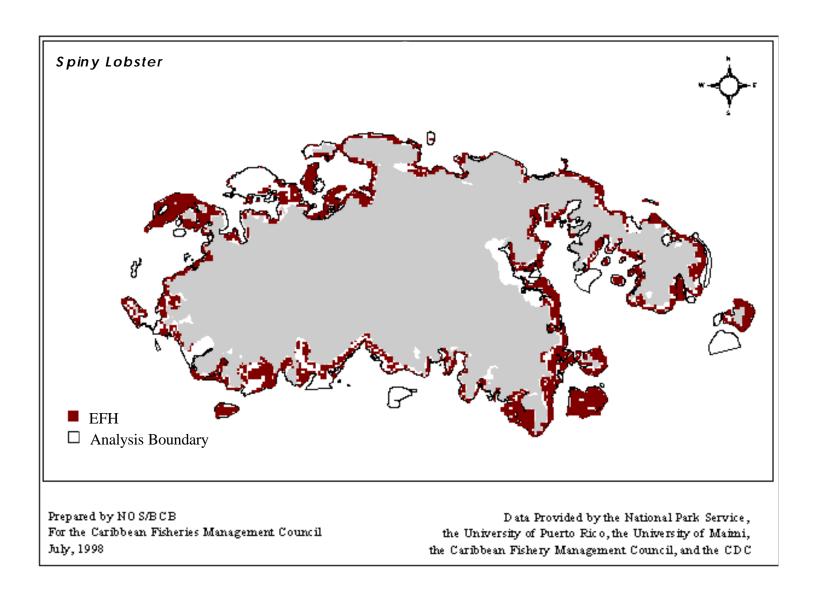


Figure 2.44. EFH designation for Spiny Lobster under Spiny Lobster Alternative 8.

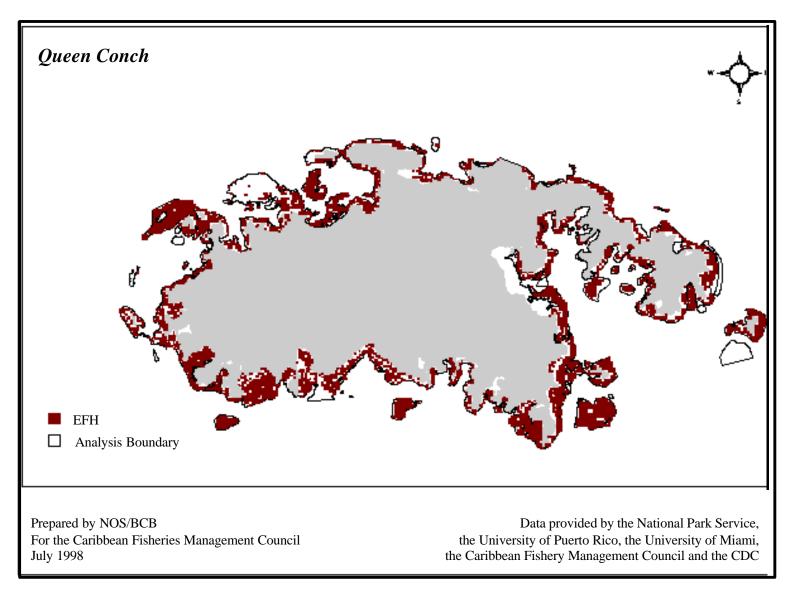


Figure 2.45. EFH designation for Queen Conch under Queen Conch Alternative 8.

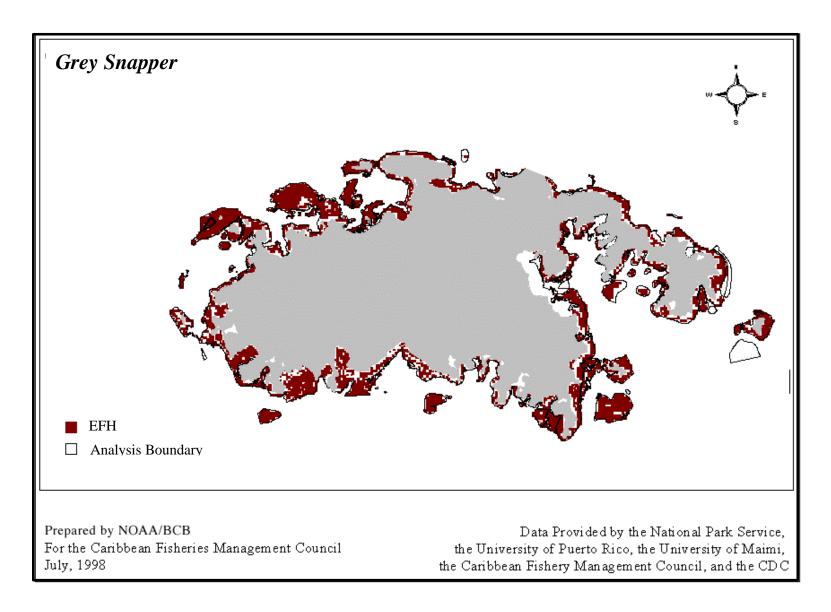


Figure 2.46. Composite EFH for Reef Fish species under Reef Fish Alternative 8, based on grey snapper.

Documented Coral in Federal Waters Highlighted Area Virgin Islands Puerto Rico Legend Habitat Boundaries Exclusive Economic Zone (EEZ) State Boundaries Bathymetry (Fathoms) Kilometers 0 10 20

Figure 2.47. Documented coral habitat in Federal waters, from Kendall et al. (2001) and Richard Nemeth (University of the Virgin Islands, personal communication)



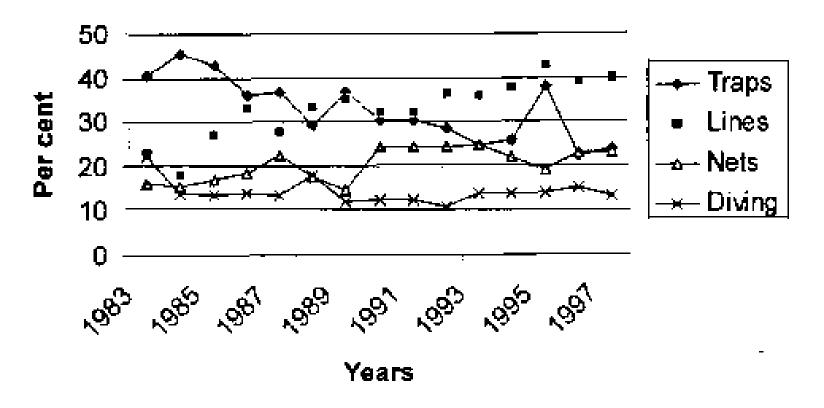


Figure 3.1. Relative distribution of catch by gear reported for Puerto Rico (CFMC 2001)

Figure 4: Percent of Total Catch by Gear (St. Thomas)

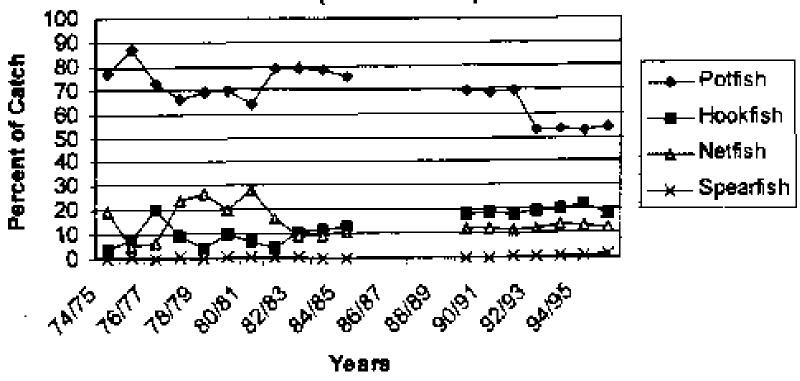


Figure 3.2. Relative distribution of catch by gear reported for St. Thomas (CFMC 2001)

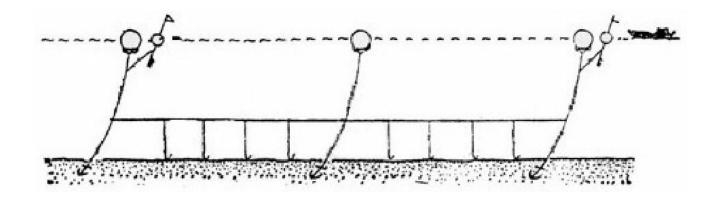


Figure 3.3. Schematic diagram of longline gear (From Barnette 2001)

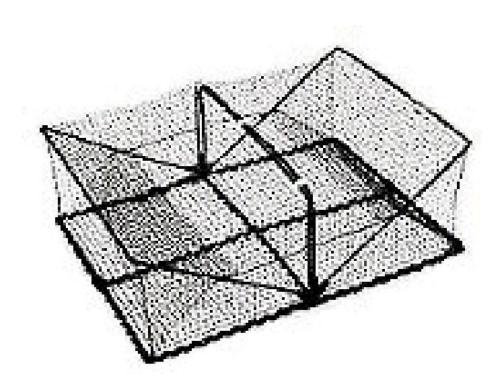


Figure 3.4. Schematic fish trap gear (From Barnette 2001)



Figure 3.5. Schematic speargun gear (From Barnette 2001)



Figure 3.6. Schematic diagram of a gillnet (From Barnette 2001).

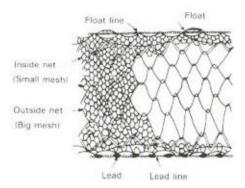


Figure 3.7. Schematic diagram of a trammel net (From Barnette 2001)



Figure 3.8. Schematic slurp gun gear (From Barnette 2001)



Figure 3.9. Schematic diagram of a dip net (From Barnette 2001)



Figure 3.10. Schematic diagram of a tropical fish net (From Barnette 2001)

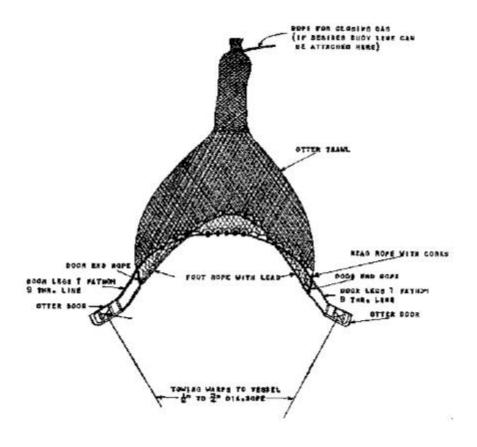


Figure 3.11. Schematic diagram of an otter trawl (From Barnette 2001)

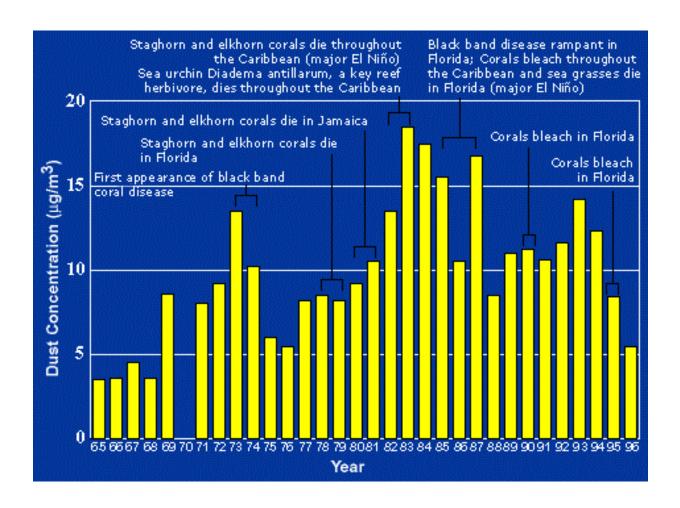


Figure 3.12. Barbados Mineral Dust Annual Average and Benchmark Caribbean Events
African dust deposition peaked in 1983 and 1987, years when extensive environmental change
was evident in Caribbean coral reefs. (Image adapted from the USGS Center for Coastal
Geology: Coral Mortality and African Dust (USGS 2001), courtesy of Dr. Joe Prospero,
University of Miami.)

Habitat NOS

La Parguera, Puerto Rico

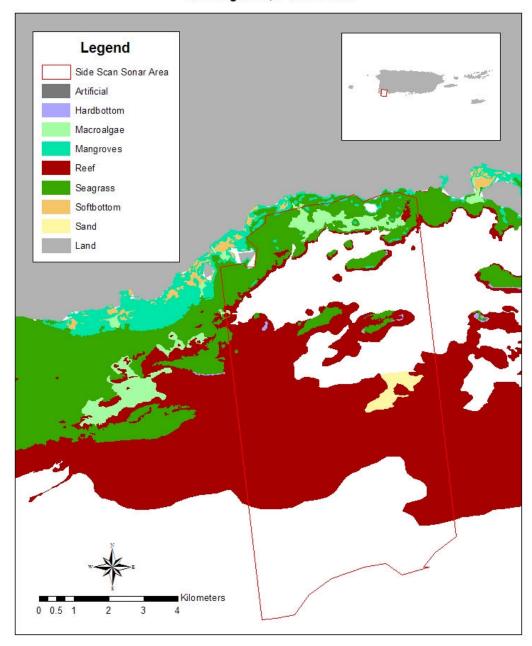


Figure 4.1a. Comparison of habitat distribution obtained by aerial photography (4.1a) (Kendall et al. 2001) and side scan sonar (4.1b) (Prada 2002) for the Parguera area of southwest Puerto Rico

Habitat: Side Scan Sonar

La Parguera, Puerto Rico

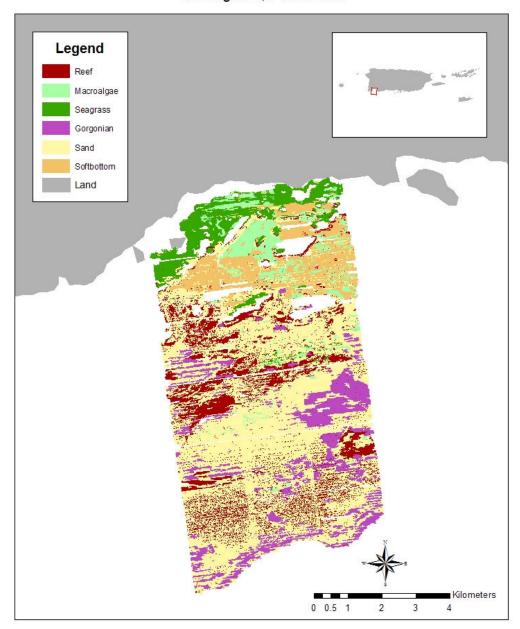


Figure 4.1b. Comparison of habitat distribution obtained by aerial photography (4.1a) (Kendall et al. 2001) and side scan sonar (4.1b) (Prada 2002) for the Parguera area of southwest Puerto Rico

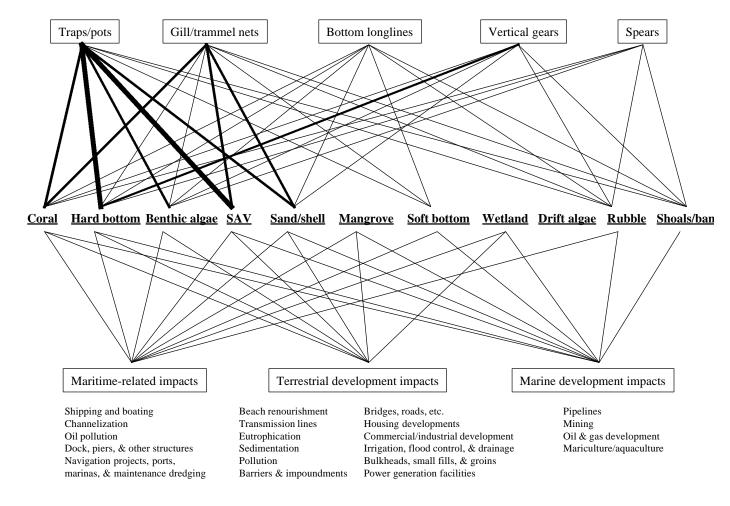


Figure 4.2 Network diagram of cumulative fishing and non-fishing activities on fish habitats in the US Caribbean.

Top row represent fishing gears potentially affecting habitats. Middle row represents potentially affected habitats. Bottom row represents non-fishing activities potentially affecting habitats. For fishing gears, increasing line thickness indicates increasing potential for habitat damage (negligible, low, or moderate fishing impact risks). Similar information not available for non-fishing impacts.